SAE National AERONAUTIC MEETING (SPRING)

Hotel New Yorker, N. Y. APRIL 3-5

PROGRAM

Wednesday, April 3

10:00 A.M. Aircraft

Pneumatic Tires for Modern Airplanes
– R. D. Evans, Goodyear Tire & Rubber Co.

A Systematic Approach to The Aerodynamic Design of Radial Engine Installations
– F. V. H. Judd, United Aircraft Corp.

10:00 A.M. Aircraft Powerplant

Improving Engine Parts by Direct Measurement of Strain
– R. G. Anderson, Aluminum Co. of America

Testing of Highly Loaded Sleeve Bearings
– J. Palsulich and R. W. Blair, Wright Aeronautical Corp.

2:00 P.M. Air Transport

The Planning of Cabin Interiors for Transport Aircraft
– Walther Prokosch, Eastern Air Lines, Inc.

Notes on Loss Prevention in Airline Operation
– Jerome Lederer, Aero Insurance Underwriters

8:00 P.M. General Aircraft Powerplant

Performance Characteristics of the BMW 003 and a Comparison with the JUMO 004 Jet Engine for Aircraft
– W. G. Lundquist and R. W. Cole, Wright Aeronautical Corp.

Aircraft Gas Turbines with Centrifugal Compressors
– R. S. Hall, General Electric Co.

Thursday, April 4

10:00 A.M. Aircraft

A Summary of Design and Test Experience with Monocoque Magnesium Wings
– J. C. Mathes, Dow Chemical Co., and Earl Rottmayer, Graduate Student, University of Michigan

The Development of Magnesium Alloys as Aircraft Materials
– J. C. DeHaven, Battelle Memorial Institute

10:00 A.M. Aircraft Powerplant

The Two-Cycle Engine for Aircraft

The Crankcase Scavenge Target Engine
– J. L. Ryde, McCulloch Aviation Co.

Investigation of an Opposed Piston Light Aircraft Engine
– J. W. Oehrli and V. J. Jandasek, McCulloch Aviation Co.

Fuel and Lubricating Oil Requirements for Personal Planes
– C. T. Doman, Aircooler Motors Corp.

2:00 P.M. Air Transport

Transport Aircraft Selection
– John Borger and L. H. Allen, Pan American Airways, Inc.

Airline Scheduling
– J. D. Hungerford and J. W. Colthar, American Airlines, Inc.

8:00 P.M. General Aircraft

Simplifying the Airplane for the Private Owner
– J. M. Gwinn, Jr., Consolidated Vultee Aircraft Corp.

Increasing the Utility of the Private Airplane
– W. T. Piper, Piper Aircraft Corp.

Friday, April 5

10:00 A.M. Aircraft

Stability Problems with Swept Wings
– H. A. Soulé, National Advisory Committee for Aeronautics

Effect of Mach and Reynolds Numbers on the Maximum Lift Coefficient
– J. R. Spreiter and P. J. Steffen, National Advisory Committee for Aeronautics

10:00 A.M. Aircraft Powerplant

Fuel Sensitivity and Engine Severity in Aircraft Engines
– S. D. Heron, Ethyl Corp.

Utilization of the Exhaust Gas of Aircraft Engines
– Benjamin Pinkel, National Advisory Committee for Aeronautics

2:00 P.M. Air Transport

Evolution of the Modern Workhorse of the Airlines
– M. B. Bassett, Glenn L. Martin Co.

Some Requirements of a "Feeder" Airplane.
– J. G. Ray, Southwest Airways Co.

BANQUET

R. D. Speas, Chairman
SAE Metropolitan Section

L. RAY BUCKENDALE, President, SAE

Toastmaster, Robert Ramspeck, Air Transport Association of America

Speaker – GILL ROBB WILSON, New York *Herald Tribune*
"Beyond the Slide Rule"

Air Controls Aid Factory Economy

Digest of paper

by STEPHEN JOHNSON, JR.
Bendix-Westinghouse Automotive Air Brake Co.

■ Annual Meeting, Jan. 10

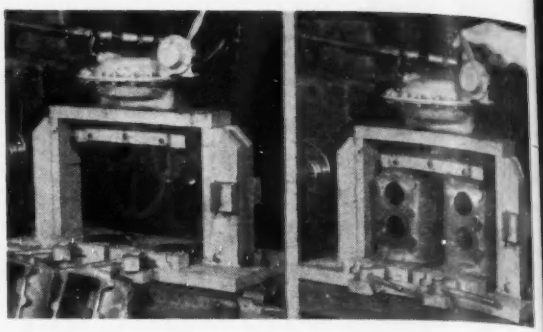
(*Paper entitled "Air Fixtures and Air Controls"*)

TIME and labor saved, plus increased production and safety, make air controls invaluable additions to shop equipment. Reporting that his own experience with air operated fixtures comprised four years of use with no accidents attributable to air failure, Mr. Johnson emphasized additionally the relative cheapness of air controls, all of which are standard, high-production items.

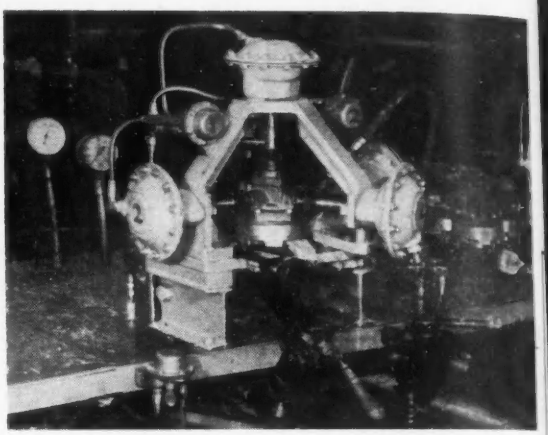
With an air supply from a two-stage steam-driven air compressor with a displacement of 992 cfm and a volumetric efficiency of 85% at 125 psi, he said, air is supplied for the operation of 375 fixtures. Only about 15% of total compressed air in the plant is required.

Brake chamber is generally used to clamp in fixtures. The absence of a packing cup lends a distinct advantage to the use of a diaphragm rather than cylinders; there is no problem of leakage or friction, and no problem of maintenance, since a diaphragm has an average life of one million cycles. The brake chamber is operated by a control valve, usually a simple rotary disc-type valve. Fig. 1 shows a cross section of the brake chamber – consisting of two metal plates, a molded composition rubber and fabric diaphragm, and a push plate with push rod attached.

Fig. 2 illustrates a milling fixture for straddle milling small compressor crankcases, in the unloaded and loaded positions. This method has the advantages of requiring only a quarter turn of a two-way valve to operate the brake chamber fixture, and of securing the parts to be milled with enough pressure to prevent chatter and slipping, thus reducing cutter breakage. Time is cut down from 0.623 min to 0.176 min per piece.



■ Fig. 2 – Fixture for straddle milling small compressor crankcases . . . unloaded position (left) . . . loaded position (right)



■ Fig. 3 – Fixture for pneumatic inspection tests on treadle-type air brake valve assembly

Fixture for milling small compressor cylinder blocks saves, in addition to time, $644 per yr. A 40% increase in production is realized with a cylinder head milling fixture.

Fig. 3, showing a fixture for making pneumatic inspection tests on a treadle-type air brake valve assembly, illustrates a design to eliminate manual screwing of fittings to the part during test. First valve operates the top brake chamber to secure the valve in the fixture; No. 2 advances three plungers at once to close valve ports. A tight seal is given by steady pressure of the brake chamber, so that testing is extremely accurate. The two-way valve mounted on the bench turns on air for the leakage test. Valve on the right supplies air to an air cylinder that actuates the pedal of the valve as in actual operating conditions. Sealing and actuating the valve pedal by air controls eliminates fatigue, realizes a monthly saving of $128.50.

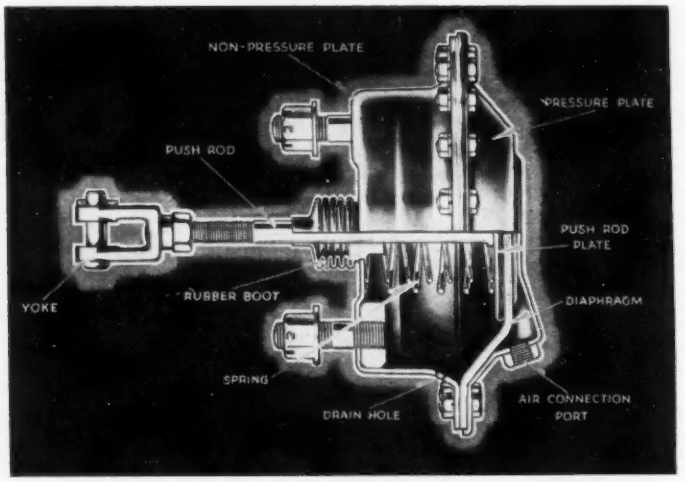
Pneumatic inspection tests on relay valve assemblies eliminate screwing of fittings to the valve, thus increasing production over 100%. Rejections are cut down greatly by test accuracy.

The fixture used on a machine for drilling and boring operations on cylinder heads for compressors gives about 50% more production than hand mechanical operation.

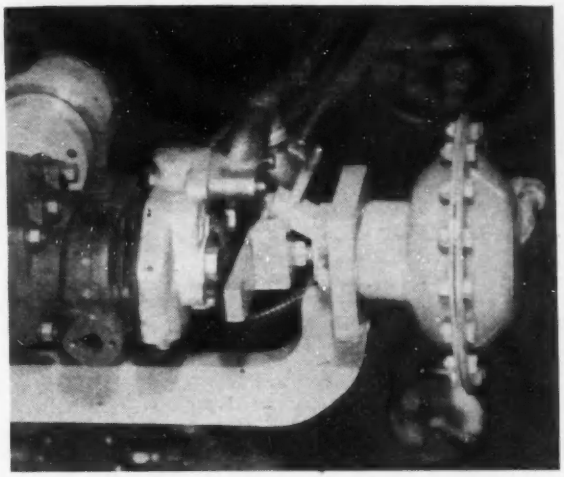
An inexpensive brake chamber operated by two-way valves can take the place of an overlarge, hazardous, relatively expensive hydraulic arbor press in pressing conventional oil seals into small end covers of compressors.

Direct labor savings of $600 yearly are effected by fixtures used to position and hold compressor crankshafts for keyway milling operation. Handling rifle drilling operations in this way produces an estimated 100% increase in production per man hr over hand mechanical clamping.

The running test of compressor assemblies utilizes a quick-acting, air-operated clamping fixture, shown in Fig. 4. Nuts are not required on cylinder head studs, or holding-down bolts on base of compressor. This is a particularly safe installation because if air pressure should drop to a low point, the swing-type lock would prevent the compressor from coming loose and causing damage. Safety lock is released by the operator when he opens the air valve. When air pressure is released, the entire clamp swings out of position. The operator then can easily load and unload his compressors. Yearly labor savings of about $5000 can be realized in this way, since this clamping



■ Fig. 1 – Cross-section of brake chamber



■ Fig. 4—Quick-acting air-operated clamping fixture used on compressor assemblies for production running test

method saves 1½ min per cycle over the old method.

Other examples served to substantiate further Mr. Johnson's claims for the efficacy of air fixtures and air controls in promoting economy, safety, and greater production.

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Field Tests Further Winter Fuel Progress

Excerpts from paper

by WAYNE GOODALE
Standard Oil Co. of Calif.

■ Spokane, Nov. 9

(Paper entitled "Winter Problems with Wartime Fuels and Lubricants")

WINTER operation of automotive equipment in cold climates has always involved problems in cooling system maintenance, in changing to winter grade lubricants, and in providing heated garages. However, one of the few items that has not required too many special considerations has been fuel, except during the war. For a number of years the petroleum industry has controlled the characteristics of gasoline so as to provide substantially uniform performance regardless of the season.

Correct seasonal grades of gasolines became a casualty of war in late 1942 when the Petroleum Administration for War issued the first directives limiting the volatility characteristics. The purpose of this was to insure adequate supplies of volatile high octane gasoline, particularly for aviation, that would permit military equipment to start and operate at full power quickly in an emergency. The volatile fractions that would normally be used for civilian convenience, therefore, became a military necessity.

First and most conspicuous result of the poorer volatility was harder starting and slower warm-up. There were a number of other unfavorable results:

1. Lower gasoline mileage due to excessive use of the choke.
2. Increased deterioration of the crankcase oil due to dilution.
3. Increased sludge and gum formation in the engine due to faster deterioration of the crankcase oil.
4. Increased engine wear and maintenance expense due to slow warm-up and poorer conditions of the crankcase oil.

Volatility may be defined in general terms as the ease with which petroleum fractions vaporize. It is ordinarily measured by distillation according to the procedure prescribed by ASTM. This is a batch distillation carried on in the absence of air and, in this respect, is entirely unlike the distillation that takes place in the carburetor and manifold of a gasoline engine.

As an engine does not "understand" ASTM or equilibrium air distillations, it is necessary to determine the reaction of engines to fuel of various boiling ranges to determine their requirement for various temperature conditions under which they are used. The practical minimum temperature is the minimum that would be expected to be reached approximately five days during the month. Temperatures in western United States range from 25 F to —25 F. As starting and warm-up begin to present problems at even the highest of these temperatures, it is evident that the degree of difficulty experienced will vary directly with the reduction in temperature.

In studying the effect of gasoline volatility on performance, special fuels covering a wide range of volatility are placed in a car and the starting and warm-up performance determined. The ease with which an engine may be started and warmed up is directly related to specific points on the ASTM distillation curve of the fuel used. This has been studied by tests in the laboratory and on the road. The relative time required to start at a comparatively low atmospheric temperature is dependent upon the temperature at which the more volatile fractions are vaporized. The warming-up phase is defined as the time required after starting until full acceleration without misfiring can be obtained without the use of the choke. The time for warm-up is shown to be related to the 50% ASTM temperature.

Because vaporization is a function of temperature, and as carburetor, manifold and engine temperatures depend upon atmospheric temperature, the latter has a marked effect on starting and warming up. The 90% ASTM distillation temperature furnishes an index of the amount of crankcase dilution which may result at low operating temperature or during starting and warming up. In modern cars, however, the use of crankcase ventilators and water thermostats has reduced crankcase dilution to a negligible quantity with volatile fuels and properly maintained engines.

As diesel engines operate by compression ignition and utilize an injection fuel system, there is no manifold vaporization problem such as exists in spark ignition engines. The two outstanding problems for these engines, from an operator's standpoint, are starting, which is related to the cetane number, and the solidification of the fuel, which is related to the pour point. Cetane number is to diesel fuel what octane number is to gasoline. It is an arbitrary yardstick used to measure ignition quality and is determined by a standardized engine and procedure. Atmospheric temperature influences starting materially, as the temperature of the compressed air in the cylinder must reach some minimum level before ignition can take place. Starting cannot be accomplished in a reasonable time at temperatures below freezing, even with a relatively high cetane number fuel. In such instances it is preferable to use a special starting fluid that will ignite even at sub-zero temperatures, or apply heat to the engine to raise the temperature to a level that will start the regular fuel.

As the result of tests conducted in Alaska during the past two winters, a starting fluid was developed that permits the starting of diesel engines in less than 10 sec at temperatures as low as —50 F. This material is injected through the intake manifold during the cranking operation by atomizing with a portable spray gun, or, preferably, with a primer system. At sub-zero temperatures, it was necessary to continue spraying the starting fluid for a few seconds to aid combustion until the combustion chamber was warmed up sufficiently to burn the diesel fuel. Cold-room tests have been conducted using aircraft engines in which successful starts were made at temperatures as low as approximately —40 F. In all the tests made below 0 F the engines were lubricated with crankcase oils diluted with gasoline to reduce the viscosity low enough to permit cranking. The reason for the success of this starting fluid compared to others that have been used in the past is the fact that it has a seven-fold wider range of inflammability than conventional hydrocarbons. Also, it is very unstable under the pressures existing in diesel engines, and self-ignition takes place at very low temperatures. This starting fluid has also been found to be of material assistance in starting certain makes of diesel engines at temperatures as high as 40 F.

We now have fuels of even better than prewar quality. However, it does not appear that new automotive equipment in

large volumes is going to be available to replace the millions of vehicles that are on the road. It, therefore, is imperative that operators use every precaution possible to prevent the winter difficulties discussed if satisfactory operation is expected.

New Equipment Gives Needed Power Boost

Digest of paper

by S. FLOYD STEWART
Leece-Neville Co.

■ Kansas City, Oct. 9

(*Paper entitled "Automotive and Aircraft Electrical Equipment"*)

PRIME prewar aims in electrical equipment were higher output for all automotive vehicles, lighter weight for aircraft. But, Mr. Stewart reported, it has taken the war to bring about rapid acceleration of progress in this field, and to accomplish results that have exceeded any expectations.

Both automobiles and aircraft, he said, started with little or no electrical equipment, with the generator as a battery charger, and gradually added accessories which raised power requirements. The present automobile generator has the capacity to carry the entire load and charge the battery as well. As for aircraft, generating capacity on a large plane now is sufficient to supply a small town.

For the future, he said, there is every indication of more and more gadgets for automobiles, as well as air conditioning, heating, lighting, and refrigeration units on buses and trucks. While weight has not been the primary consideration for automobile generators, it has been kept within bounds by limitations on size. In order to keep the battery to a reasonable size on future gadget-laden vehicles, additional generating capacity will be necessary. If electrical operation encompasses the whole vehicle, as it may soon do, present generators will be far from adequate. Special problem is presented by city buses, police cars and others which must stop at terminals or cruise. Design point, therefore, must be set at the minimum speed at which full load output will be required.

With the stricter limitations of aircraft design, generators are now being built which will deliver far more power per lb. The problem is aggravated, he said, by losses in a generator which can be minimized only by generous design practices. In an automobile, mounting arrangement and space limitations are prohibitive . . . in an airplane, weight. For this reason, it is necessary to provide a means for carrying away by proper ventilation the heat generated by these losses. A fan for the purpose is useless over 15,000 ft, because of the decrease in air density. Provision of enough air under pressure serves the purpose, carrying away the losses and preventing overheating of the generator. This is important because it has facilitated accomplishments in high kw/lb.

Generators for both aircraft and automotive equipment, he believes, are trending toward higher output, differ only in weight consciousness and speed of operation. Aim for aircraft is to keep the overhang as small as possible; for automotive vehicles, to provide output at low speed. An alternator-rectifier combination can satisfy both requirements, he said. Although it provides no actual saving in weight, it does divide the weight since it need not be located near the engine. Blast cooling keeps the rectifier to minimum weight and size, gives a weight of approximately 15 lb for 400 amp output. Alternator is conventional wound rotor type, requiring two slip rings and two small brushes; it may be operated over a wide speed range, since it is free of commutation and brush wear problems. Useful minimum speed is somewhere between 3000 and 4000 rpm, depending on load requirements; top speed is rated as 10,000 rpm, but if necessary it can be run at higher speed.

It is possible, he reported, to design some measure of voltage control directly into a constant speed generator. Complications arise, however, when it is necessary to control the voltage of a variable speed generator. Control by rheostat is impossible for aircraft and automotive generators. Vibrating regulator made voltage control automatic and made widespread use of variable speed generators possible, but limitations on field current which can be handled while maintaining long contact life lowered its value.

Currently common type, he reported, is the single contact regulator, which places a further burden on contact life because of resistance value which must be placed across vibrating contacts. Presently used by the Armed Forces is an English carbon pile regulator, deriving its success in operation from spring arrangement, magnetic structure and cooling feature. Selection of carbon grades and surface finish combined with proper spring and magnetic structure gives a smooth change in resistance. This regulator provides automatic adjustment in accordance with the system's varying operating conditions. Easy accommodation to any type of installation is allowed by cooling feature and sufficient ventilation.

Carbon pile regulator, Mr. Stewart said, can be used on automotive type D.C. generators, and will also have an important place in heavy duty applications where generator size and performance will benefit from the use of high field currents that could not be safely handled by the vibrating contact.

Feederliner Needs Challenge Designer

Digest of paper

by BOWMAN R. OTTO
Feeder Airlines Association

■ Detroit, Oct. 10

(*Paper entitled "Flight Requirements for the Feeder Airline"*)

EQUIPPING the future feeder line operator is one of the major challenges now before aircraft engineers, Mr. Otto declared. Although some of the twin engine transports now in use may serve temporarily, he said, each of them has one or more disadvantages to render it inefficient for the purpose of feeder line operation. The few types of plane whose performance records matched feeder line requirements have long been obsolete or out of production.

Therefore, he said, new design and performance features must be met by a new type of air transport aircraft. According to the specifications set up by the Technical Committee of the Feeder Airlines Association, primary attention should be given to economy of operation, low altitude and small airport performance, rapid loading and refueling features, passenger comfort, and safety of operation.

Future Feederliner Sketched

Future feederliner, to approach these objectives, should be a high wing, all metal transport with at least two engines, capable of accommodating 18-22 passengers at 200 lb apiece, as well as baggage. Cargo capacity should be 1500-2000 lb, but it should be possible, by removing front seats, to use some space for either passengers or baggage. Tricycle type landing gear should be designed to withstand rough field landings and cross winds of 20 mph.

For the important matter of rapid ground handling features, consideration should be given to items such as under-wing refueling, retractable passenger steps, and individual mail and cargo bins accessible from outside. Economy dictates use of the lowest horsepower engine commensurate with performance required.

Problems are minimized somewhat, he said, by the relatively narrow limits within which feederliners must operate. There will be no need for high altitude, high speed aircraft. Since flight levels will range from 500 ft to 1500 ft above ground level, high altitude supercharging and pressurization will be unnecessary.

Since Class 2 and 3 airports will predominate along feederline routes, ability to land and take off within 1000 ft under full load is essential. Average cruising speed of 170 mph will be adequate, since feederliner landings will probably be required on an average of every fifty miles. An operating range of 500 miles is desirable for cases in which air pick up system eliminates landings.

Increased angle of approach, and better take-off and climb characteristics, can be obtained by accessory improvements so that a wider selection of airport sites will be available.

Air conditioning, individual lights, ventilators, toilet, washstand, and other features will raise feederline standards to DC-3 trunkline transport levels. A crew of two, with the co-pilot doubling as steward, and ample doors for passengers and cargo, complete the general outline for structure and performance characteristics.

If feederline service is provided throughout the country, Mr. Otto believes, a suitable feederliner would have a domestic market for over 400 aircraft. The task of meeting specifications, considered impossible by some engineers, is, in his opinion, perfectly feasible – as evidenced by enthusiasm on the part of many engineers, and definite proposals on many drawing boards.

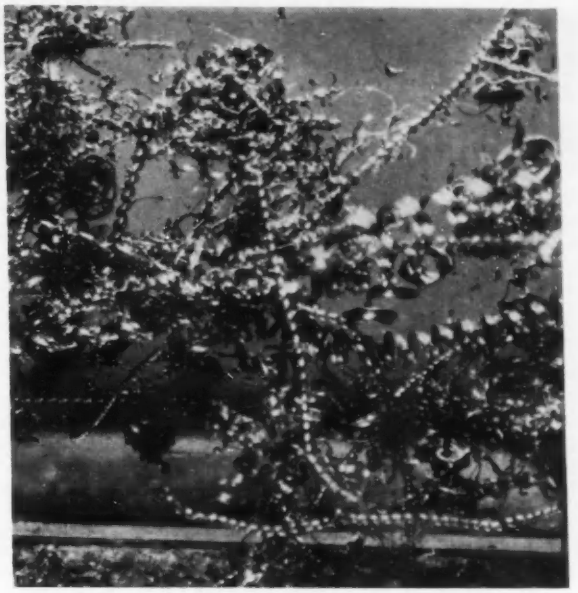
He emphasized the importance of designing now for feederline needs of the future – building present specifications on the basis of visualized future traffic volume.

Honing Refinements Lend Improved Quality Control

Excerpts from paper
by LAWRENCE S. MARTZ and DOUGLAS T. PEDEN
Micromatic Hone Corp.

■ Annual Meeting, Jan. 10

(Paper entitled "Latest Developments in Honing Techniques")



■ Fig. 1 – Honing chips from a soft steel rocket tube, showing variegated size

MODERN honing, which can now remove as much ferrous metal as finish boring or grinding, in many cases in shorter time, offers not only new cost economies, but also increased product quality control necessary for continued technological progress. New developments comprise: generation of finer accuracy; lower tolerance control of uniform size; rapid, heavy stock removal; and generation of any desired kind or type of functionally characterized cylinder bore wall quality.

Design engineering consistently regards geometric accuracy as the first and most important requirement in mechanical efficiency. Without it, all other benefits of controlled size, surface quality and careful assembly are of little value. Recent developments in precision measuring instruments evidence the desire for even closer approach to theoretical perfection in bore roundness and straightness.

Many design compromises are unavoidable. They serve substantially to complicate the accomplishment and maintenance of low tolerance accuracy in production and in operation; they usually induce distortions, blow-by, fatigue failures and other losses.

Reproducible, uniform accuracy in most modern honing applications in bores above 4 in. in diameter is held within 0.0005 to 0.001 for roundness and straightness; in bores from 4 in. in diameter to 1 in. in diameter, within 0.0003 to 0.0005; and in bores below 1 in. in diameter it is usually well within 0.0003, and in some particular jobs as low as 0.00005.

In many cases the benefit of closely controlled size cannot be fully realized because of other considerations, such as differentials in the coefficients of expansion and contraction of different metals, machinability and machining variables, and other factors which reduce mechanical efficiency.

New size controls used in honing are either of mechanical or fluid pressure types. In the mechanical type size control, the abrasive members in the honing tool are mounted in a plastic shell which serves as the stone holder. An extended, plastic end tab at each end of the stone, while wearing away as the stone wears down, is allowed to enter a precision sizing ring at the end of each reciprocating stroke. Then, when the stones have expanded to the desired bore sizing ring size, frictional resistance of the tabs on the sizing ring turn the ring, tripping a Micro switch which stops the honing operation.

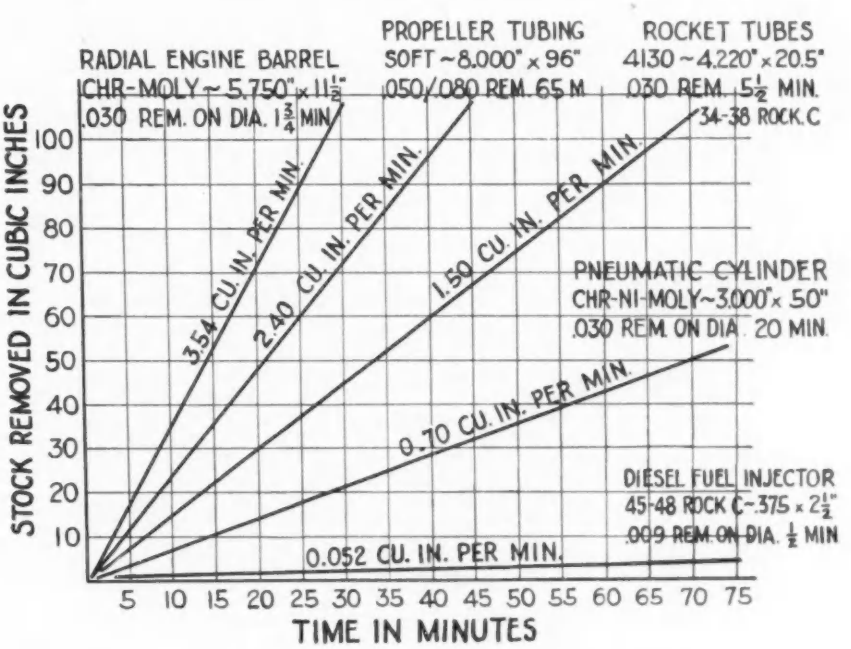
Fluid pressure type size control is based on the Solex principle of metering the back-pressure on a fluid escaping from a number of orifices in the honing tool body.

Heavy stock removal in a very short time by the hone abrading method, using many thousands of simultaneous cutting contacts, actuated in low, impulse-force shearing action under low speed and low pressure, is the most recent and one of the most important developments in the honing process since it was originated. The varied size of the honing chips shown in Fig. 1 is typical of all honing applications on softer metals – continuous chips as long as 4 in. have been recovered.

Modern honing now removes from 25 to 30 times as much metal as was formerly practicable; and, in some applications, it can do this much work up to six to eight times as fast as was formerly possible. These developments were installed in many war production jobs; they have now been successfully adapted to a number of postwar applications, as shown in Fig. 2.

Heavier, faster stock removal in hone abrading has been accomplished by two developments: additive treatments of bonding material, and multiple and progressive honing using 2- and 3-spindle machines, equipped with rotating, indexing fixtures.

It is the function of modern honing techniques to provide any kind of surface finish and bore wall quality that may be desired, or required by conditions of functional operation. For close tolerance, pressure lubricated bearings, fluid seals, assemblies having low operating heat, for example, this may be



■ Fig. 2 – Rate of stock removal on typical honing jobs

Efficiency Decrees Specialized Application of Turbine Types

by H. J. CLYMAN
Baldwin Locomotive Works

■ Philadelphia, Dec. 12

(*Paper entitled "Jet Propulsion and Gas Turbines in Aviation"*)

GAS turbines for aircraft use may be divided into two general classes according to the way the thrust is produced: one is the jet propulsion engine where the thrust is obtained by accelerating a mass of gases through the engine; the second is the gas turbine propeller drive where the thrust is obtained for the most part from a propeller to which power is supplied by the turbine.

Early in the development of jet engines it became apparent that they would only be effective in very high speed airplanes; thus it became important to keep the diameter as small as possible and to allow the air to travel in a straight path to reduce the losses inherent in turning the air.

Probably the smallest jet engine built is the Westinghouse 9.5A, which is used to power a small flying bomb called the "Gorgon."

In developing jet engines, good progress has been made in improving both the thrust and specific fuel consumption for a given engine size. From the middle of 1943 to near the end of 1944 the thrust of the 19A and 19B Westinghouse engines was improved from 960 lb to 1480 lb. Specific fuel consumption measured in lb of fuel per hr per lb of thrust was improved from 1.41 to 1.15, an improvement traceable to the increased efficiency of the compressor and the turbine. If the compressor or turbine efficiency is raised 1%, then the overall efficiency is increased by approximately 3%, so it can be seen that with fairly small increases in component efficiencies the overall efficiency is improved to a marked extent.

Let us now look at a comparison between an adjustable pitch propeller which is capable of converting shaft power into thrust horsepower efficiently over a fairly wide range of speed, and a jet engine. Jet engine efficiency does not equal propeller efficiency until speeds of around 500 mph are reached. Below this speed jet efficiency, consequently fuel economy, is inferior. It should be pointed out that at these high speeds compressibility effects impose critical aircraft design limitations, so much aerodynamics research must be carried out before jet propulsion can be utilized to its best advantage.

To compare a jet engine with an up and down engine, we must go back to the fact mentioned previously that the performance of a jet engine is expressed in pounds of thrust which the engine develops, and it is necessary to consider the relationship which exists between the thrust of a jet engine and the normal bhp which a reciprocating engine develops. The relationship is

$$\text{Equivalent bhp} = \frac{\text{thrust} \times \text{aircraft velocity}}{375 \times \text{propeller efficiency}}$$

This leads to a result that at 300 mph forward speed, 1 lb of thrust equals 1 bhp if the propeller efficiency is 80%, a reasonable assumption. At 600 mph, 1 lb of thrust is equal to 2 bhp if propeller efficiency remains the same, but at that speed compressibility effect on the blade tips reduces the propeller efficiency to about 53%, so that we have the result that 1 lb of thrust is equal to 3 bhp. Using these values, a jet engine of 1000 lb thrust will drive a fighter airplane of Spitfire size as fast as a 1000 hp piston engine, but fuel consumption will be more than twice that needed by the piston engine. To give this airplane a sea level speed of 600 mph, however, the power required will be 12,000 hp, and such a piston engine will weigh roughly 12 times the weight of the original 1000 hp engine, because piston engines tend to have a constant specific weight per bhp.

On the other hand, the thrust required to double the speed of the airplane is only four times as great, hence, the jet engine will only weigh four times the weight of the 1000 lb thrust engine because jet engines tend to have a constant weight per unit thrust. If we compare fuel consumption of the two engines at 600 mph, the reciprocating 12,000 hp engine uses 1.5 lb of fuel per hr per lb of thrust, whereas the jet engine fuel rate should be 1.4 lb of fuel per hr per lb of thrust.

In other words, there is now very little difference in the fuel consumption of the two engines, and there is a tremendous advantage in size and weight with the jet engine. In fact, the 12,000 hp engine would weigh approximately 20,000 lb installed, and would be too large for a Spitfire airplane. The jet engine would not weigh more than 2000 lb.

Comparative Evaluation

The jet plane will excel in maximum speed, altitude ceiling and best cruising speed, but the conventional airplane will excel in length of take-off run, maximum rate of climb and range. By increasing the thrust of the jet engine by 50 to 70%, the take-off run would be reduced to about the same as the conventional fighter, the climb and ceiling would be greatly increased, and the cruising speed and maximum speed would be increased slightly, all at the expense of a heavier powerplant and a further serious reduction in range.

Thus, we can see that the jet engine is going to be used for high-speed military

QUALITY CONTROL

continued from preceding page

the smoothest possible kind of surface finish.

It is further the function of modern honing techniques to provide any kind of controlled surface roughness, such as the "lay" of the cutting mark pattern. These may include multi-directional patterns similar to that shown by the traced pattern in Fig. 3, cross-hatched patterns, surface finish in which all cutting marks are codirectional with the operation of the mating part over the surface, smoothly finished areas superimposed on a rougher surface, and regularly cavitated surfaces produced by finish honing and etching. All these variations serve the overall function of minimizing wear, preventing fatigue failure, dissipating operating and frictional heat, and assuring complete or adequate lubrication under *variable conditions of functional operation.*

In conclusion, the maximum conservation of forces and materials, the maximum efficiency of most of our work-performing machines and tools, the smoothest trouble-free operation and longest operating life depend upon the control used in making these products. Modern honing now provides greater economical control and reproducibility of the final processing result than has ever before been possible. It removes the desired amount of metal rapidly and selectively as may be required to correct errors and to generate close-tolerance geometric accuracy and final size. By reason of these newly developed controls, it is now possible to minimize the quantities of metal removal formerly unavoidable in machining practice. Modern honing permits design engineering greater freedom from practical compromises, and higher efficiency in the improvement of product quality.

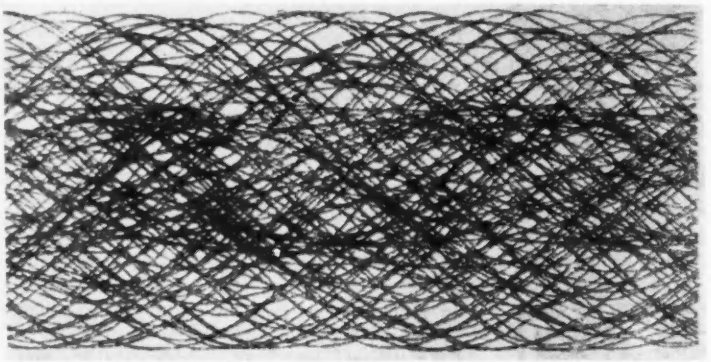


Fig. 3 – Actual trace of path followed by one abrasive grit in multi-directional abrasive actuation

fighter interceptor airplanes for quite some time unless speed becomes attractive enough to airline operators to sacrifice some of the economy of slower-speed, lower-power equipment.

Gas turbine propeller drive engine is basically a jet engine in that it has the same components with the addition of suitable gearing and a propeller.

The "prop" drive engine is longer due to the fact that more stages are used in the compressor for a high pressure ratio and greater efficiency, where weight can be added to achieve greater overall efficiency than is practicable in a jet engine, where it is necessary to get the lightest weight engine for a given thrust. The power available for driving the propeller is the difference between the power supplied by the turbine and that required by the compressor and the accessories.

The diameter of a geared gas turbine will be less than half that of an up and down engine of comparable power. To compare a reciprocating engine with a gas turbine propeller drive engine it is necessary to make a comparison on the basis of finished airplanes designed to best fit the characteristics of their particular powerplants. The size, weight and cooling requirements of an engine, together with the efficiency in converting energy into thrust hp and the ease with which it is installed in clean, low-drag airplanes, gives the full measure of its overall economy.

The modern "up and down" engine is a marvel of engineering and has been developed to a high peak of efficiency under the impetus of military requirements. It is light in weight and is very reliable, but power ratings have reached a point where further major increases can be attained by an improvement in fuels or by the addition of cylinders. The frontal area is already limited by the allowable piston speeds, hence larger engines will be longer engines and specific weight will probably increase as engine outputs become larger. Very large reciprocating engines will require the usual controls and accessories. Cooling requirements and exhaust disposal systems will also complicate the installation and create maintenance problems. The reciprocating engine is, of course, adapted to cruising flight rather than sustained high speed flight where the highest efficiency and greatest reliability are achieved only where the engine is operated under 60% of rated power.

In the gas turbine propeller-drive engine the cooling requirements are such that no large amounts of air are needed, and consequently the cooling losses are small. The gas turbine can be designed with a predetermined amount of thrust being obtained in addition to shaft power for the propeller. This division is usually 80% shaft power and 20% jet thrust. Thus the very small nacelle drag and the propeller losses are just about cancelled out by the thrust obtained in this manner to make the total thrust of the geared gas turbine fairly constant over a wide range of speed. The shaft power output of the turbine approximately equals the net thrust hp available.

The best efficiency is obtained at peak load, which points to its use in the high speed airplane. This peak efficiency is such that when the gas turbine is installed in a well designed airplane the specific fuel rates are very close to those obtainable by a reciprocating engine, particularly at higher altitudes where cool air is taken into the engine.

The reciprocating engine will undoubtedly continue to hold its present position in the field of low power and for planes of low speed. However, the gas turbine will come into its own both as a jet engine and as a propeller drive for high-powered planes and for high-speed flight. Of the three types of powerplant, the turbine propeller-drive is superior to the reciprocating engine in all speed ranges and over the jet engine in low and intermediate speeds. The jet engine is preeminent in the highest speed range.

The gas turbine propeller-drive engine will be the first type of gas turbine to be used in commercial flights and in less than ten years the development of this type of engine will be sufficient to enable its use in all but the lower-powered airplanes. The jet engine will continue to be used for high-speed flight, for the most part in military airplanes.

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Rented Plane Bids for Postwar Dollar

Digest of paper

by HOWARD AILOR
Fly-Urself Airplane Service

■ Detroit, Oct. 10

(Paper entitled "Personal Flying")

A NATIONWIDE airplane rental service may be the next great step in American aviation development – if engineers can be persuaded to design airplanes to the specifications of those who sell, rent and operate them. Predicting enthusiastic reception of a service which will enable the customer to rent a plane cheaply and conveniently, fly to his destination, and leave the plane at another station, Mr. Ailor urged the co-operation of aircraft engineers in the development of equipment which will encourage volume business, and thus enable mass production and more jobs.

If the market which he hopes to see developed for personal flying is to reach this peak, he said, utility, comfort, safety and simplicity will have to be rigorously pursued in airplane design.

As an example of what can be accomplished in the personal flying field, the author described the projected Fly-Urself system – a cooperative undertaking to be participated in by a national organization of operators. Individual operators will enjoy full insurance protection and a sound credit system, will be able to offer the public better equipment at lower hourly rates, and can gain more profit than private operation could offer.

Two and four seat standard company planes will be used, and a percentage of gross rental will go to operators, who may handle service and maintenance at fixed rates, and distribution on commission.

Rates will be based on a new power-time recorder, which will give not only the time the engine is in operation, but also the amount of actual power taken from the engine. Rates will be based on cruising at 60% of power, so that overspeeding will be expensive.

As the vehicles for this extensive aircraft plan, Mr. Ailor proposes development of two airplanes . . . a two place and a four-five place plane. Both are to be all metal with tricycle, retractable landing gear.

Two place plane is to have a 75 hp engine, weigh 1500 lb, have a range of 500 miles, cruising speed of 125 mph, payload of 420 lb including baggage, and useful load of 600 lb.

Four place plane will weigh 5000 lb, have two engines of 250 hp each, have a range of 1000 miles, cruising speed of 200 mph, payload of 1050 lb, and useful load of 2200 lb.

With a sufficiently large production schedule, he said, a price of $4000 for the smaller plane, $12,000 for the larger, is not at all impossible.

With mass application of this system, he believes, it will be possible to smooth operations to such an extent that no overhaul will be done on the planes; rather parts will be replaced, even engines, so that repair work can be done in the shop while planes continue to operate.

This represents a large challenge to the aircraft engineer, he admitted, but not an insurmountable one. He feels that results will justify efforts expended . . . in terms of employment, service, and volume of business.

DISCUSSION

John F. Geisse, assistant to the Administrator of Civil Aeronautics for Personal Flying, predicted a 50-to-1 increase in non-scheduled flying, an expenditure of one billion a year, corresponding to the earnings of 500,000 workers at $2000 a year. He expects the use of second hand airplanes and the utilization of rental services to expand personal flying far beyond the limited range of those who can afford to own a new plane.

Various surveys of Air Forces personnel and the public indicate, he said, that there are at present more than 17 million persons in the upper half of the income bracket who wish to learn to fly. In the next ten years an additional 8,140,000 prospects are indicated, while 630,000 will move out of the prospect group due to age.

If we assume that these figures are six times too high, he pointed out, we still would have 4,500,000 pilots at the end of 10 years, and would have to train more at the rate of 420,000 a year. The 4,500,000 would have to spend only an average of $200 per year to approximate an annual expenditure of one billion dollars, he declared.

"This expenditure would be by those who wanted to learn how to fly. It does not include those who will desire to fly as passengers in non-scheduled flying. Nor have I included cargo or other non-commercial services," he said.

S-S System Promises Higher Aircraft Lubrication Ceiling

Digest of paper
by P. H. SCHWEITZER
Pennsylvania State College
and L. P. SHARPLES
Sharples Corp.

■ So. California, Oct. 4

(Paper entitled "S-S System of Lubrication for Aircraft Engines")

FREQUENT failures of lubrication systems at altitude result from insufficient inlet pressure in the pressure pump, the authors pointed out. In the conventional lubrication system with the usual gravity feed from the oil tank to the pressure pump (Fig. 1), delivery decreases at reduced tank pressure more than by the percentage of the entrained air. This is because, besides the entrained air, some dissolved air that comes out of solution displaces oil in the tooth space; in addition, all air swells at reduced pressure and displaces more oil.

Required inlet pressures at oil tank for minimum lubrication are shown in Fig. 2. This assumes 50% of normal sea level delivery with clear oil as the minimum oil delivery for satisfactory engine lubrication.

With 10% air in the oil, they reported, lubrication breaks down at 32,000 ft.

Apparent answer to the problem, the authors said, is a pressure boost for the pressure pump . . . this, however, requires difficult extra drive.

Pressurizing the tank by installing a spring loaded valve between oil tank and vent line, or by throttling the vent of the oil tank, is another solution. Air liberated from the oil provides the pressure, and, they explained, other things being equal, one lb pressure in the tank raises lubrication ceiling by 9000 ft.

Scavenge pump can be used as a booster by removing oil tank from between it and the pressure pump, making a closed circuit.

In this way, with the scavenge pump discharging into the inlet side of the pressure pump, high enough inlet pressure can be maintained to insure adequate oil delivery. Oil storage must be provided for under this system to replenish oil continuously consumed by the engine.

In the S-S shunt system, Fig. 3, the scavenge pump discharges through a closed line into a pressure-type deaerator from which it flows to the cooler, then through an eductor into the pressure pump, which forces it into the engine.

The system stops short of being actually closed by reason of a storage tank vented to the atmosphere, and a restricted communication between the deaerator and the atmosphere.

Six principal advantages are claimed for the S-S system:

1. Lubrication ceiling is substantially raised; at 40,000 ft, there is an inlet pressure of 15 hg abs and ample oil delivery, as compared with 5 hg and a trickle of oil for the conventional system.

2. Installation is lighter, perhaps simpler than conventional system – it makes use of a plain instead of hopper tank, smaller sized tubing between tank and pressure pump, and simple, light deaerator and eductor.

3. Oil tank can be located almost anywhere, regardless of head and distance.

4. Diluent for take-off can be introduced into circulating system without diluting oil in tank.

5. Air is eliminated from tank before it reaches the cooler, while the oil is hot and separation easy.

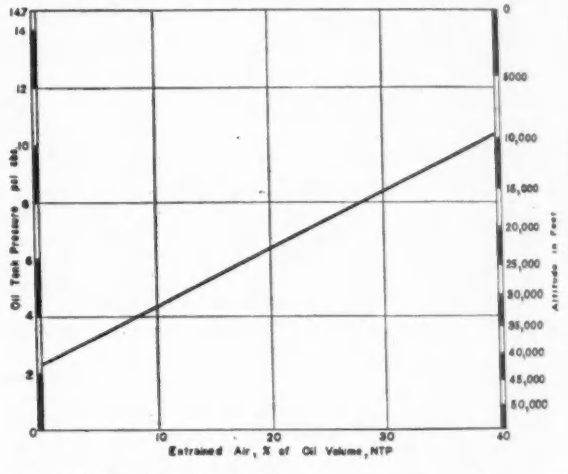
6. There are no apparent disadvantages of any significance; the system is easily adaptable to existing installations and "frozen" design.

Oil passes from the scavenge pump to the deaerator to be freed of air. The scavenge pump consists of a small cylindrical chamber with tangential oil inlet on top and outlet on bottom. There is a small passage for air which collects above the oil.

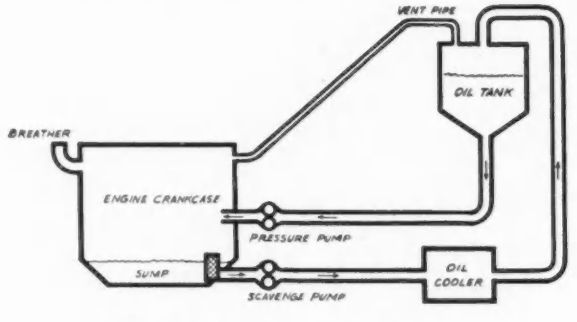
In the deaerator of the fixed vent type, the passage area is restricted, so that although air and foamy oil pass continuously through the passage, the pressure in the deaerator remains at a level sufficient to force the deaerated oil through the cooler and eductor nozzle. A 1/16 in. orifice is the approximate requirement for allowing most of the air to escape. Air and the foamy oil with it go up to make-up tank where the oil settles out.

In the float-type deaerator, the float valve closes when oil level is high enough. When oil level reaches approximately 2/3 height, the valve closes. When freed air accumulates on top of oil, the oil level is depressed and the weight of the float opens the valve, allowing air to escape. Oil level rises again and the valve closes. At sea level, this cycle is repeated about 40 times per min.

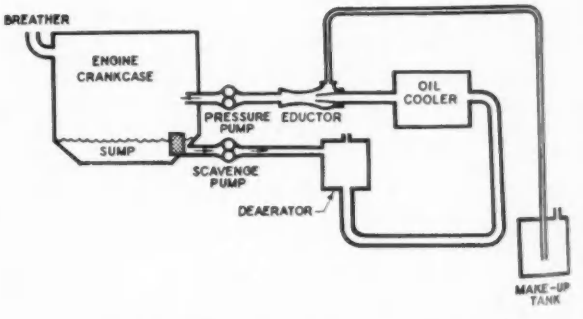
With either type, about 3½% air remains in the oil. One important advantage of both is that, being able to handle oil under pressure, they can be placed between



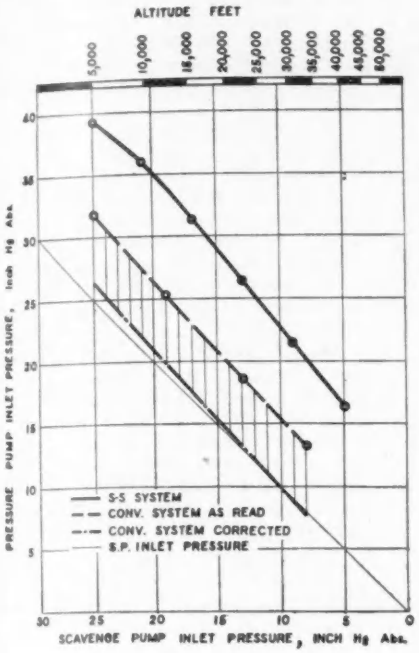
■ Fig. 2 – Required inlet pressures at oil tank to provide minimum lubrication



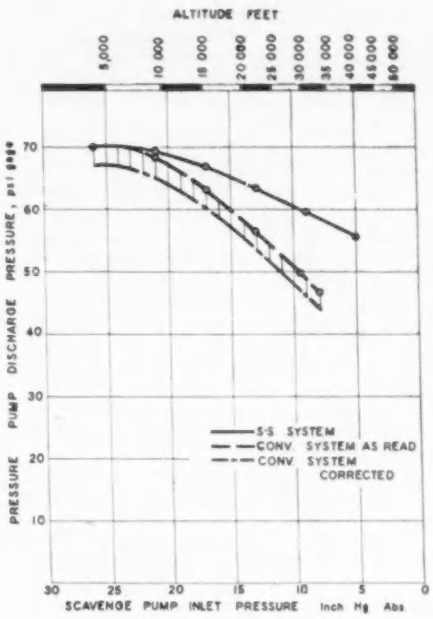
■ Fig. 1 – Basic components of typical aircraft engine lubrication system



■ Fig. 3 – Basic components of S-S system



■ Fig. 4 – Comparison of pressure pump inlet pressures



■ Fig. 5 – Comparison of pressure pump discharge pressures

the scavenge pump and oil cooler, the logical place for deaeration, since high oil temperature facilitates separation of air. Thence the oil flows to the cooler and eductor.

Eductor is a venturi through which the main flow passes, surrounded by a passage communicating to the side line leading to the make-up tank. It sucks liquid continuously through the side passage by means of the vacuum created there by the main flow. Under the S-S system, there is little flow in the side line except at the beginning, and pressure usually is zero. Eductor takes in oil as fast as make-up oil is needed, and thus compensates for oil used in the engine or vented from the deaerator as foam. Loss of oil in the system produces a considerable vacuum in side passage of the eductor, and oil begins flowing from the make-up tank into the main circuit. If outside liquid is added . . . for example, if dilution takes place . . . pressure rises above atmospheric and excess oil is ejected through the side passage to the make-up tank. The system is persistently stable. Pressure boost and stability are given by the system as an entity, however – scavenge pump, deaerator, eductor and pressure pump.

Fig. 4 compares pressure pump inlet pressures of the S-S and conventional circuits. "Perfect" tank is used for conventional circuit for more scrupulous test. Figures for conventional type are corrected to compensate for the boost in hg given by location of oil tank considerably above pressure pump. Discharge pressures are compared in Fig. 5. Tests showed almost a 20,000-ft gain in lubrication ceiling with S-S system. Automatic regulation of oil level and replenishment of oil from make-up tank, and foolproof restoration of disturbed equilibrium, are noteworthy features of the system.

Emphasizing the importance of the deaerator, the authors reported that elimination or incapacity of the deaerator causes the circuit to gradually go dry with any loss of oil. Loss of make-up ability and stability on the part of the system will result from improper functioning of this vital organ. There is a very definite point in deaerator efficiency below which the system becomes unstable.

At 40,000 ft simulated altitude, they said, the deaerator pressure dropped to about zero, and pressure in the eductor throat approached absolute zero after a small amount of oil was drained from the system; make-up, therefore, functioned satisfactorily at highest altitudes; altitudinal advantage comes from the fact that pressure pump inlet pressure is higher than scavenge pump inlet pressure in the S-S system, so that air requirements decrease, while in conventional system the opposite situation prevails.

Under the S-S system, they added, it is no longer the pressure pump that limits altitude, but the scavenge pump; capacity and unobstructed inlet to scavenge pump, and large enough deaerator to take care of air, are required. Requisite size is not, however, prohibitive. A 6 x 6 in. deaerator can handle a 14 gpm flow.

In its present form, the authors pointed out, the S-S system involves no changes in major engine or airplane components – only a change in plumbing. Thus arises a final important advantage of flexibility.

Extensive Airport Action Asked To Meet Expanding Postwar Needs

Digest of paper

by KENNETH PERRY
Civil Aeronautics Administration

■ Baltimore, Nov. 8

(Paper entitled "The National Airport Plan")

THE United States leads the world in the transportation field. To keep it in that position, Mr. Perry believes, constant vigilance is necessary. Millions of Federal dollars are expended annually on highways and waterways; adequate airports bear the same relation to the future of aviation as did highways to the automobile industry; a well-planned national airport system will, he feels, insure the same success.

Reviewing recent developments in this field, he described the Development of Landing Areas Act of 1940, which grew out of a CAA survey of the previous year. It was a plan with an ultimate goal of 4000 airports. Growing military requirements increased CAA appropriations, so that to date some $400,000,000 have been expended on development projects at 530 airports.

Deviation from the original plan came with more stringent demands for specialized army and navy airport facilities, in the form of somewhat larger airports at many locations than initially contemplated. Class IV airports, for instance, were increased to 700 rather than the contemplated 48. In addition, there are now 443 Class III airports, 810 Class II and 981 Class I, the majority of which are turf or sod.

Inadequacy is indicated by the fact that 47% of the counties in this country have no airports, about 1/3 of the communities with over 1000 population have airports, and most big city airports are overcrowded.

In 1944 a resolution was approved by Congress directing the Secretary of Commerce to prepare through the CAA a survey and report on the need for airports, and to recommend appropriate legislation; purpose

of this revision of the national airport plan was to provide a basic program for orderly development of airports and appurtenant facilities adequate to meet demands of civil aviation within the immediate future. Various planning commissions and officials, as well as private and professional operators, were given hearings.

The forecasting necessary in formulating a plan of this nature, he pointed out, involves a decision as to the probable future amount of air travel, kinds of equipment, and frequency of schedules.

CAA-proposed program recommends construction of about 3050 new airports, and improvement of 1625 existing fields at a cost of over one billion dollars for clearing, grading, paving, lighting and radio facilities. Land and buildings will cost an additional $230,000,000.

The National Airport program advises construction or improvements which will increase the number of Class I airports, for personal flying, to a minimum of 981; Class II, for feeder and personal flying, to at least 810; Class III, for present-day twin-engine airplanes, to 443 or more; Class IV, for larger airplanes, at least 403; and Class V, for long-range domestic or foreign operations, from 305.

On the credit side of the balance sheet is the large number of potential users and owners of airplanes; a potential million and a quarter man-months of employment on buildings and other necessary auxiliary facilities; continuous employment for some 60,000 on the national network system; beneficial effects of airport growth on employment in allied industries and in concessions at airports; usefulness of airports as bases for operations and places to store private planes; and possibilities of further expansion and tremendous increases in value.

Weather Worries Wane for Present Aircraft

Excerpts from paper

by JOHN F. GILL

Eastern Air Lines, Inc.

■ Annual Meeting, Jan. 10

(*Paper entitled "All-Weather Flying Technique"*)

BEFORE discovery of correct usage of the turn and bank indicator, pilots maintained normal flight attitude by reference to the horizon or some other fixed object. Sooner or later the inexperienced pilot would venture too far into a condition of low ceiling or restricted visibility; then, if terrain was not suitable for landing, there would commence an experience which, if he survived it, the pilot would thereafter avoid. To maintain visual contact with the ground necessitated flight too low for safety, dodging trees, flying over and under wires, with houses suddenly looming up, and with the ever-present fear of loss of control through stall or an improperly executed turn. This might be called a hedge-hopping or cotton-dusting method of weather flying.

Another system, the "climb and jump" technique, was in vogue to a limited extent in military circles and in the early airmail contract flying. This method was to climb on top of clouds or fog when pinched off, and, if possible within the fuel range of the airplane, to locate an area with sufficient ceiling and visibility to permit flight beneath the overcast. Failing to find the desired "hole," the approved technique was to fly the gas out at a reasonably high altitude, then go over the side with the parachute rip cord ring clasped firmly in the right hand. This technique of weather flying was rather frowned upon by airmail operators, who displayed little enthusiasm in increased membership of the Caterpillar Club.

About 1928 it was gradually becoming accepted fact that, provided the pilot kept the needle of the turn indicator reasonably centered, and the indicated airspeed sufficiently above the stalling speed, he could enter a cloud with reasonable expectancy of emerging from the opposite side with sky and ground in their normal relative positions, and on a more or less straight flight path. The number of completed flights under conditions of restricted visibility and low ceiling increased in proportion to the average airmail pilot's rising confidence in his ability to maintain control of the plane by reference to instruments rather than horizon.

Early airway scheduled flying was accomplished without benefit of ground navigational aids other than rotating beacon lights spaced approximately 10 miles apart, and lighted emergency fields every 30 miles. A navigational low ceiling technique developed around 1928 was to fly at an altitude just clearing the terrain, from 200-500 ft. At this altitude, the pilot maintained visual ground contact from 40 to 60% of the time, and thus was able to stay on the line of beacons, avoiding the necessity of resorting to the climb and jump technique.

Fortunately, radio ranges were in process of installation, rendering obsolete this "ground-level plus" technique of bad-weather navigation. Radio ranges were of the four-course, low-frequency, loop-antenna type. Although these left much to be desired, they did permit navigation through bad weather at a safe altitude. The "on-course" or center line of each leg is approximately three deg in width, and is identified by a steady monotone signal; as the plane moves to either side of the "on-course," a quadrant identifying letter, an "A" on one side and an "N" on the opposite becomes audible. Proven methods of orientation, necessary to establish position in relation to a range station should a pilot become confused or lost, were worked out and adopted.

At terminals and intermediate stops, range stations were installed in such location as to permit one leg of the range to be aligned along a runway of the airport. In the early installations, too little consideration was given to securing the best location to serve the airport in question, under conditions of low ceiling and restricted visibility. The technique necessary to navigate from range station to range station, with let-down and landing after passing range station, required considerable training in technique, and complete concentration, and still does.

With the installation of radio ranges and better instrument panels, new weather flying techniques came into use. These changes in flying technique were brought about almost entirely through pilots' exchange of information gained through personal experience.

Airport ceiling of 300 ft, and ½ to one mile visibility were approximately the minimums at which flight operations could be conducted with the aids in use. Lower minimums were necessary if operations were to be improved. New and additional aids and facilities both on the ground and in the planes were explored for possibilities of assistance to safely lower operating minimums.

Three different methods of achieving partial or total blind landings were advocated by separate sponsors. One group favored a row of approach lights set on poles, a second instruments and radio beams, and a third, radio compass locator stations parallel and in line with a runway. It is regrettable that a composite system, using the good features of each method, was not worked out. Had this occurred, instrument landings in scheduled air transportation could have been an accomplished fact several years ago.

New Equipment Described

Restrictions as to ceiling and visibility for landings and take-offs can be eliminated with the use of equipment now available. The installation would consist of localizer and glide path, runway and approach lights and two compass-locator stations. The system is simple and easy to fly, and requires little training. Arriving in vicinity of the landing field, the pilot switches on the localizer receiver to the frequency for the field. He tunes one automatic direction finder to the outer marker and one to the middle marker. The outer and middle markers are non-directional, low-frequency, low-powered radio beacons, installed on an extension of the center line of the runway. Pilot homes on the outer marker by the automatic direction finder, reduces air speed and lowers landing gear. He passes over the outer marker at a predetermined altitude which clears terrain obstructions by a safe margin. Positive indication of passage over the outer marker is given aurally and visually. With position fixed both laterally and longitudinally, the pilots starts a descent, to pass over the middle marker, at approximately 300 ft, maintaining a straight track by means of the automatic direction finder, tuned to the middle marker, and by reference to the localizer needle. Descent is continued, maintaining direction by means of slight corrections indicated by localizer needle, and by visual reference to a blanket of reference neon bars extending out 3000 ft from end of runway, and, in addition, high-intensity, condenser-discharge type of lights in the neon blanket. Descent is continued until runway lights become visible; the landing is then completed visually.

Some of the present en route weather flying problems, severe turbulence, icing conditions and strong headwinds, will be lessened through use of new high-speed, high-altitude planes, operated with advanced flight and dispatch techniques. Greater choice in flight altitudes through

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Check List of SAE Meetings Papers

Here are listed those papers presented before National and Section Meetings of the Society of Automotive Engineers, which are still available in mimeographed form.

The SAE policy, in respect to mimeographed copies of these papers, is to make them available for at least one year after presentation.

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NEW Papers This Month

Check Here	Author	Title of Preprint of Paper	Date of Presentation
____	Ayres, Vincent	Valves and Valve Testing	Dec. 6, 45
____	Best, H. W. Ainsley, W. G. Keyser, P. V.	Symposium on Fuels and Lubricants Significance of Octane Number Progress Report on Grease Projects Improved Gear Lubricants	
____	Sabina, J. R. Jeffery, Lt.-Col. R. E.	Stable Gasoline for War and Peace Heavy Duty Oils in Military Service	Jan. 17, 46

Check Here	Author	Title of Preprint of Paper	Date of Presentation
____	Chidlaw, Maj.-Gen. B.	Past, Present and Future of Jet Propulsion	Dec. 10, 45
____	Harms, Carl F.	Turbosupercharger Design and Application	Nov. 19, 45
____	Hartzell, H. L.	Effect of Post-War Automotive Practices on Ignition Performance	Dec. 4, 44
____	Pigott, R. J. S.	Analysis of Positive Supercharger Losses	Nov. 14, 45
____	Zucrow, Dr. M. J.	The Rocket Power Plant	Jan. 11, 46

Papers Previously Announced

Vehicles

____	Austen, Robert N.	Maintenance Engineering of Chassis Leaf Springs	May 9, 45
____	Bentz, E. J. H.	Diesel Cold Starting Problems	June 11, 45
____	Brunken, Renke	White Hydro Torque Drive	Jan. 7-11, 46
____	Bryan, H. F.	Combustion in a Pre-Combustion Type Diesel Engine	Jan. 7-11, 46
____	Cass, Robert	Motor Trucks of the Future	Jan. 7-11, 46
____	Churchill, H. E. Delp M. Z. Hykes, P. G.	Fundamentals of Suspensions	Jan. 7-11, 46
____	Collins, Tom J.	Post-War Diesel Engines	Feb. 12, 45
____	Colwell, A. T.	Alcohol-Water Injection	Jan. 8-12, 45
____	Colwell, A. T.	Fuel Requirements for Farm Tractors	Sept. 13, 44
____	Davies, R. H.	Design of German Hydraulic Systems and their Components	Jan. 7-11, 46
____	Deimel, A. H.	Performance of Hydraulic Transmissions	Jan. 7-11, 46
____	Fairbank, H. S.	Highways of the Future	Jan. 7-11, 46
____	Gerler, Capt. W. C.	The German Jumo 004 Engine	Jan. 7-11, 46
____	Gohn, E. P.	Post War Truck Selection and Conditioning	Feb. 12, 45
____	Gohn, E. P.	Cold Starting and Fleet Operation	Jan. 8-12, 45
____	Hammond, C. F.	Steering as Affected by Suspension	Jan. 7-11, 46
____	Hawthorne, W. R.	Some Factors Affecting the Design of Jet Turbines	Jan. 7-11, 46
____	Heusner, C. E. Johnson, E. T.	Substitutes for Tin in Automotive Vehicles	Jan. 7-11, 46
____	James, W. S.	The Perfect Automatic Transmission	Jan. 7-11, 46
____	Landen, E. W.	Combustion Studies of the Diesel Engine	Jan. 7-11, 46
____	Laurie, G. W. Taussig, W. A. Willett, H. L., Jr. Wilson, D. K.	Symposium – Approaches to Vehicle Retirement	Jan. 7-11, 46
____	Loweke, E. F.	Power Brake Valves	Nov. 1, 45
____	McCain, G. L.	Engineering of Involute Splines	Jan. 7-11, 46

____	Miller, R. J.	Torque Converters	Jan. 7-11, 46
____	Mock, F. C.	Engineering Development of the Jet Engine and Gas Turbine Burner	Jan. 7-11, 46
____	O'Conner, B. E.	Damping in Suspensions	Jan. 7-11, 46
____	Oetzel, J. G.	Post War Brakes	May 10, 45
____	Park, Bryan	Over the Road Diesel Operation	May 15, 45
____	Peirce, T. H.	Bonded Rubber Torsional Vibration Dampers for Diesel Engines	Jan. 8-12, 45
____	Price, N. C.	Mechanical Design Considerations Influencing Blading Performance in Aircraft Gas Turbine Power Plants	Jan. 7-11, 46
____	Quartullo, O. F.	The Driver's Comfort	Jan. 7-11, 46
____	Sanders, Ray	Cleaning Symposium – How Chemistry Simplifies Automotive Cleaning Methods and Procedures	Jan. 7-11, 46
____	Schilling, Robert	Flexible or Spring Medium of Suspensions	Jan. 7-11, 46
____	Shoemaker, F. G. Gadebusch, H. M.	Effect of Fuel Properties on Diesel Engine Performance	Jan. 7-11, 46
____	Siemmons, C. O.	Rubber Tracks for Agriculture	Sept. 13, 45
____	Smith, L. H.	Motor Coaches of the Future	Jan. 7-11, 46
____	Stout, W. B.	What Motor Cars Could Be	Jan. 7-11, 46
____	Super, R. K.	Review of Brake Design and Methods of Rating Brakes for Commercial Automotive Vehicles	Jan. 7-11, 46
____	Taylor, C. Fayette	Effect of Engine Exhaust Pressure on the Performance of Compressor Turbine Units	Oct. 4, 45
____	Twyman, L. R.	Hydraulics as Applied to Tractors and Farm Machinery	Sept. 13, 45
____	Vincent, E. T.	Piston Development Review	Jan. 8-12, 45
____	Watson, R. A.	Bearing Developments Resulting from Restrictions of Materials	Sept. 15, 45

Aeronautics

____	Bachle, C. F.	Some Possibilities of Turbine Compounding with the Piston Engine	Jan. 8-12, 45
____	Berry, B. M. Rollins, F. S.	Aviation Lubricating Oils	Aug. 24, 45
____	Campbell, Kenneth	Some Advantages and Limitations of Centrifugal and Axial Aircraft Compressors	May 7, 45
____	Canney, F. R.	Provisions for Overwater Operation	Dec. 3-5, 45

____	Christenson, C. M.	A Report on the Nature of Ice Formation on Aircraft as Related to Airline Operations	Nov. 1, 45
____	Cunningham, J. W.	High Conductivity Cooling Fins For Aircraft Engines	May 1, 45
____	Cutrell, Lt. Col. E. A.	All-Weather Flying Facilities	Jan. 7-11, 46
____	Dietrich, F. J.	Aircraft Riveting and Equipment	May 1, 45
____	Dolza, John	Coordination of Fluid Coupling Driven Auxiliary Supercharger Speed to Engine Manifold Pressure	Jan. 8-12, 45

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Check Here	Author	Title of Preprint of Paper	Date of Presentation
_____	Doman, Carl T.	General Requirements for Helicopter Engines	Nov. 1, 45
_____	Draney, J. J.	Heat Recovery as Applied to the Heating and Anti-icing of Aircraft	Jan. 7-11, 46
_____	Eaton, D. C.	Cruising Economy By Use of Water Injection	Nov. 1, 45
_____	Edwards, M. L.	Performance of the Air Oil Separator in Engine Breather Systems	April 24, 45
_____	Etchells, E. B. Underwood, A. F.	Silver Bearings	May 7, 45
_____	Field, Howard	Reduction of Vulnerability of Aircraft Hydraulic Systems	April 19, 45
_____	Fraas, Arthur P.	Flow Characteristics of Induction Systems	Jan. 8-12, 45
_____	Friedlander, J. W.	Operating Costs of Personal Airplanes	May 7, 45
_____	Gill, John	All-Weather Flying Techniques	Jan. 7-11, 46
_____	Gulbransen, H. E. Capt.	Transoceanic Air Navigation	Dec. 3-5, 45
_____	Hanley, W. V. Hundere, A.	Economics of Airline Fuel Utilization	Nov. 1, 45
_____	Haver, R. L. Goodin, H. A., Jr.	Design Trends in Aircraft Exhaust Systems	Jan. 7-11, 46
_____	Heino, A. F.	Airport Terminal Design	Dec. 3-5, 45
_____	Hicks, R. D.	Service Experience with Light Aircraft Engines	May 7, 45
_____	Johnson, S., Jr.	Air Fixtures and Air Controls	Jan. 7-11, 46
_____	Jones, Alun R.	Airplane Icing Problem and Its Alleviation through Research	Nov. 1, 45
_____	Kelley, Bartram	Helicopter Stability with Young's Lifting Rotor	March 19, 45
_____	Kelly, R. D.	Review of Air Transport Developments in America	Jan. 7-11, 46
_____	Kendrick, J. B.	Applied Aero-Economics	Jan. 8-12, 45
_____	King, W. J.	Axial versus Centrifugal Superchargers for Aircraft Engines	May 7, 45
_____	Kirchner, O. E.	Foreign Observations	Jan. 7-11, 46
_____	Knight, J. E. Baxley, C. H.	Modern Aircraft Refueling	Oct. 4, 45
_____	Knight, William	Stresses in Disc Wheels	April 5-7, 44
_____	Landgraf, F.	Helicopter Design Problems	Nov. 1, 45
_____	Lingle, Col. D. G. Seitz, Capt. G. A.	Army-Navy Aeronautical Standardization	Reprinted Nov. 42 SAE Journal
_____	Long, D. W. Lt. Col.	Air Transport Command Cargo Loading Experience	Dec. 3-5, 45
_____	Loudenslager, O. W.	Structural Model Testing	May 1, 45
_____	Lusk, Capt. R. J.	Protection of Electrical Systems on Military Aircraft	April 24, 45
_____	McFarland, F. R.	Aircraft Engine Gears	May 7, 45
_____	Maloy, Raymond B.	A Resume of Desirable Characteristics for Non-Stalling, Non-Spinning Airplanes	May 7, 45
_____	Messinger, B. L.	Refrigeration for Air Conditioning Pressurized Transport Aircraft	Dec. 3-5, 45
_____	Moreton, D. H.	Problems Involved in Airframe Lubrication	Aug. 24, 45
_____	Mullen, H. A. Boelter, L.	Aircraft Spotwelding at Willow Run	May 1, 45
_____	Robinson, Ray	The Postwar Market for Personal Planes	May 7, 45
_____	Rodriquez, D. L.	Wartime Aircraft Service Problems – Their Solution	June 19, 45
_____	Rowe, M. R. Ladd, G. T.	Water Injection for Aircraft Engines	Aug. 24, 45
_____	Rudd, J. K. Heath, Westcott	Radio Interference and the Aircraft Engine	Oct. 5-7, 44
_____	Saint, S. P.	A System Specification for Air Navigation and Traffic Control Development	Dec. 3-5, 45
_____	Schweitzer, P. H. Sharples, L. P.	S-S System of Lubrication for Aircraft Engines	Oct. 4, 45
_____	Short, Mac	An Aircraft Approach to Automobile Body Design	Jan. 7-11, 46
_____	Sweeney, W. J. Kunc, J. F., Jr. Morris, W. E.	Aircraft Engine Induction System Deposits	Jan. 7-11, 46
_____	Warner, Edward	International Airworthiness Standards	Jan. 8-12, 45
_____	Weeks, W. L.	Factors in Aeration and Deaeration of Aircraft Engine Oil	Oct. 4, 45
_____	Wendell, E. E. Warden, H. H. Kerr, H. H.	Weight Reduction of Aircraft Braking System thru the Use of Reverse Thrust Propellers	Oct. 4, 45

Fuels and Lubricants

Check Here	Author	Title of Preprint of Paper	Date of Presentation
_____	Adams, E. W.	Performance Testing of Wheel-Bearing Lubricants	Nov. 6-7, 45
_____	Alspaugh, M. L.	Gasoline Gum Tolerance of Ordnance Equipment (Report of CFR Committee)	Jan. 7-11, 46
_____	Ambrose, H. A. Trautman, C. E.	Engine Oil Foaming	Jan. 8-12, 45
_____	Becker, C. F.	Gasolines – Past, Present, Future	Dec. 1, 44
_____	Berry, B. M. Rollins, F. S.	Aviation Lubricating Oils	Aug. 24, 45
_____	Brabbs, Lt. A. D.	Testing Heavy-Duty Lubricating Oils for Naval Service	Nov. 9-10, 44
_____	Brandes, Dr. O. L. Donaldson, H. H., Jr.	Use and Evaluation of Heavy Duty Engine Oils	May 9, 45
_____	Brooks, D. B.	A Review of the Development of Reference Fuel Scales for Knock Rating	Jan. 7-11, 46
_____	Cattaneo, A. G. Bollo, F. G. Stanly, A. L.	A Petroleum Research Engineer's Outlook on Fuels for Conventionally Powered and Gas Turbine Aircraft	Aug. 24, 45
_____	Effmann, Karl H.	Engine Oil Consumption Determination	March 8, 45
_____	Galindo, Lt. Com. H. L.	Navy Experience With Diesel Fuels and Lubricants	May 17, 45
_____	Griep, Com. E. F. Goddin, Lt. Com. C. S.	Significance of Cetane Number in Fuels	Nov. 6-7, 45
_____	Holaday, W. M. Mount, W. S.	Discussing the Fuels and Lubricants Supply Problem	May 15, 45
_____	Kauppi, T. A. Pedersen, W. W.	Silicones as Lubricants	Nov. 6-7, 45
_____	Keyser, Paul V.	Progress Report on Gear Oils Projects-CRC	Jan. 8-12, 45
_____	Kratzer, J. C. Green, D. H. Williams, D. B.	New Synthetic Lubricants	Jan. 7-11, 46
_____	Larson, M.	Diesel Fuel Additives Create New Concepts	Nov. 6-7, 45
_____	Penfold, Norman C.	Some Comments on Engine Testing of Heavy-Duty Oils	Nov. 9-10, 44
_____	Pigott, R. J. S.	Considerations Affecting Fuels and Lubrication from the War Work	Jan. 16, 45
_____	Ronan, J. T.	Motor Oil Performance	Dec. 11, 44
_____	Savard, A. J.	Fuel Vapor Recovery	Feb. 20, 45
_____	Tongberg, C. O. Ellis, R. E. Baxley, C. H.	Application of Heavy Duty Additives to Aviation Oils	Nov. 6-7, 45
_____	Veal, C. B.	Philosophy of Cooperative Research	Jan. 7-11, 46
_____	Wolf, H. R.	Motor Oils – Regular, Premium and Heavy Duty	Jan. 7-11, 46

Miscellaneous

Check Here	Author	Title of Preprint of Paper	Date of Presentation
_____	Aufmuth, R. B.	The Practice of Powder Metallurgy	March 12, 45
_____	Collyer, John	Outlook for Rubber for the Automotive Industry – Synthetic and Natural	Jan. 7-11, 46
_____	Dunning, Dr. J. R.	Development of Atomic Energy	Jan. 7-11, 46
_____	Frye, Col. J. H.	Metallurgy of Foreign Automotive Materiel	Jan. 8-12, 45
_____	Jackson, P. B.	Aluminum After the War	March 14, 45
_____	Martz, L. S. Peden, W. T.	Latest Developments in Honing Techniques	Jan. 7-11, 46
_____	McBrearty, J. F.	Utilization of New High Strength Aluminum Alloys	Oct. 4, 45
_____	McCloud, J. L.	Methods of Specifying Materials	Jan. 7-11, 46
_____	Miller, Roy A. Tatman, Max E.	Shop Aspects of the New High Strength Aluminum Alloys	Oct. 4, 45
_____	Porter, F. P.	Methods for Calculating Torsional Vibration	Jan. 8-12, 45
_____	Somes, Howard E.	Induction Heat Treatment of Internal Surfaces as Applied to Automotive Industries	Jan. 8-12, 45
_____	Strothman, E. P.	Some Cases for Steel as a Material	Jan. 8-12, 45
_____	Riesing, E. F.	Synthetic Rubber Mechanical Parts in Present and Postwar Vehicles	Jan. 8-12, 45
_____	Vaughn, F. F.	Induction Hardening as Applied to Farm Machinery	Sept. 13, 45
_____	Zeder, J. C.	More Power to Engineering	Sept. 10, 45

Limited supply of older SAE Meetings Papers in mimeographed form is also available. A permanent file of SAE Meetings Papers is kept in the SAE Library, from which photostatic copies can be made, upon request, at cost.

SAE Coming Events

Meeting	Date	City	Hotel
• Aeronautic	April 3-5	New York	New Yorker
• Summer (Semi-Annual)	June 2-7	French Lick, Ind.	French Lick Springs
• West Coast Transportation & Maintenance	Aug. 22-24	Seattle	New Washington
• Tractor	Sept. 11-12	Milwaukee	Hotel Schroeder
• Aeronautic Meeting and Aircraft Engineering Display	Oct. 3-5	Los Angeles	The Biltmore
• Transportation & Maintenance	Oct. 16-17	Chicago	Knickerbocker
• Fuels & Lubricants	Nov. 7-8	Tulsa	Mayo

Baltimore – March 14

Engineers Club; dinner 7:00 p.m. Brakes – Fundamentals, Design and Performance – Steve Johnson, Jr., Bendix Westinghouse Air Brake Co. Friction Materials in Relation to Power Brakes – John V. Bassett, Raybestos Manhattan Co. Motion Picture – Principles of Operation of Air Brakes.

Buffalo – March 13

University Club; dinner 7:00 p.m. Light Airplanes – Fred E. Weick, vice-president, Engineering and Research Corp.

Cincinnati – March 14

Cincinnati Milling Machine Co., dinner 6:30 p.m. Plant Inspection and Demonstration of New Type of Production Milling Machines.

Cleveland – March 11

Cleveland Club; dinner 6:30 p.m. The White Hydro Torque Drive – R. Brunken, transmission engineer, The White Motor Co.

Colorado Group – March 19

Bear Frame Axle Co., meeting 8:00 p.m. Frames-Chassis Alignment.

Detroit – March 25

Horace H. Rackham Educational Memorial Building; dinner 6:30 p.m. Disable Our Patent System and You Disable America – John Anderson, president, Anderson Co. Does Styling Control the Design of Cars – Howard Darrin, stylist, Kaiser-Frazer Corp.

Metropolitan – March 7

Pennsylvania Hotel, New York; meeting 7:45 p.m. Rockets – Col. Donald Putt, Wright Field, assisted by J. A. O'Mara. Summarization of talk – Robert Cole, Wright Aeronautical Corp. Guest of honor – Col. William Councill. Motion Picture – Rocket V-2.

Milwaukee – March 1

Milwaukee Athletic Club; dinner 6:30 p.m. Symposium on German Automotive Industries. Fuel Injection Systems – R. C. Mathewson, assistant manager, American Bosch Corp. Radiators – Fred M. Young, president, general manager, Young Radiator Co. Hydraulic Transmissions – W. F. Shurts, chief engineer, Hydraulic Division. Twin Disc Clutch Co. Air Cooled Engines – A. M. Madle, electrical engineer, Briggs & Stratton Corp. Carburetor and Diesel Engines – A. W. Pope, Jr., chief research engineer, Waukesha Motor Co.

Northern California – March 12

Engineers Club, San Francisco; dinner 6:15 p.m. Transportation and Maintenance Meeting.

Northwest – March 1

Gowman Hotel, Seattle; dinner 7:00 p.m. Speaker and subject to be announced.

Oregon – March 8

Imperial Hotel; dinner 6:30 p.m. Fundamental Design of the Fageol Twin Coach Engine – W. R. Hubka, Seattle Transit System. Paper prepared by L. J. Fageol.

Philadelphia – March 13

Engineers Club; dinner 6:30 p.m. Trucks of the Future – Robert Cass, chief engineer, White Motor Co.

St. Louis – March 12

Congress Hotel; dinner 6:30 p.m. Fundamentals, Design and Performance of Power Brakes – Steve Johnson, Jr., assistant sales manager, Bendix Westinghouse Air Brake Co.

Southern California – March 8

Biltmore Hotel, Los Angeles; meeting 8:00 p.m. Heat Recovery as Applied to the Heating and Anti-Icing of Aircraft – John J. Draney, Consolidated Vultee Aircraft Corp.

Southern New England – March 6

Bond Hotel, Hartford; dinner 6:45 p.m. The Design and Manufacture of Gears – G. H. Sanborn, Fellows Gear Shaper Co.

Washington – March 14

Dodge Hotel; meeting 8:00 p.m. Gas Turbines for Aviation, Transportation and Power Generation – J. R. Carlson, steam application engineer, Westinghouse Electric Corp.

Wichita – March 14

Broadview Hotel; dinner 6:30 p.m. Lighter than Air Craft – Representative from Goodyear Aircraft Corp.

Williamsport Group – March 4

Swans Restaurant; dinner 6:45 p.m. Private Flying – William T. Piper, president, Piper Aircraft Corp.

Student Branch News

University of Wisconsin

"Insulation, Sound and Otherwise," was the topic of a paper presented at the Dec. 18 meeting of the University of Wisconsin SAE Branch by "Pat" Norris, Home Insulation Co., Madison, Wis. Mr. Norris discussed the nature of sound, techniques of sound measurement, the reasons for insulation, and various types of insulation. His presentation also covered the principles of heat insulation, examining the causes of heat losses and describing several types of heat insulation materials and their effectiveness.

At the Jan. 15 meeting of the SAE Branch James F. Roberts, Allis-Chalmers Mfg. Company, spoke on "Recent Developments in Modern Hydraulic Powerplants." He described the operation of impulse, reaction, and propeller types of hydraulic turbines, and showed slides explaining the structure, installation, and operation of turbines at various plants.

General Motors Institute of Technology

Section B of the G.M.I. SAE Branch took a field trip to the Wickes Boiler and Machine Companies in Saginaw, Michigan, on Jan. 9. Students viewed the production of pressure vessels and were interested to note the use of precision welding instead of riveting as a means of fastening. Such welds, they found, were X-rayed 100% to assure safety in operation. Forming operations were performed on very heavy materials, and much of the work was done while the metal sheets were red hot.

University of Oklahoma

The University of Oklahoma SAE Branch held a reorganization meeting on Jan. 30, signalling the resumption of the technical activities that had been interrupted by the war. Prof. E. M. Sims explained the aims and activities of the Society and of the SAE Branch, and pointed out the importance of active participation in the Branch program. Sixteen students applied for SAE Enrollment.

New officers were elected to administrate the Branch at the meeting of Feb. 7. Walter Cralle, former member of the SAE Branch who had returned to U. of O. after service in the Navy, was elected Chairman. James Lesch was voted vice-chairman, and Joseph A. Wilson, secretary-treasurer. Joseph A. Wilson was appointed to the post of field editor and James Lesch was appointed program chairman.

About S

Lothair Teetor

Ralph R. Teetor

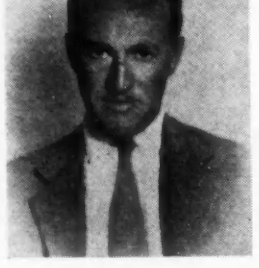
SAE Past-President Ralph R. Teetor has become president of the Perfect Circle Co., Hagerstown, Ind. Other SAE members involved in the Perfect Circle executive changes are: Lothair Teetor, who moves from the presidency to chairman of the Board; Macy O. Teetor, formerly executive engineer, who continues as vice-president in charge of engineering; and Daniel C. Teetor, who becomes vice-president in charge of manufacturing

Macy O. Teetor

Daniel C. Teetor

PAUL G. HOFFMAN, president, Studebaker Corp., and **GEORGE ROMNEY,** general manager of the Automobile Manufacturers Association, were featured as luncheon speakers at the Feb. 7-8 meeting of the National Council of Private Motor Truck Owners, Inc. Other SAE members who participated in the meeting included **ARTHUR C. BUTLER,** director of the National Highway Users Conference, and **ROBERT CASS,** chief engineer, White Motor Co.

JOHN L. BUNCE has been appointed factory manager of Pratt & Whitney Aircraft, division of United Aircraft Corp., East Hartford, Conn. Associated with Pratt & Whitney Aircraft since 1927, Mr. Bunce has,



John L. Bunce

since October, 1944, until last July, served as chief engineer of Pratt & Whitney Aircraft Corp. of Mo. in Kansas City. Prior to that he was secretary of United Aircraft Service Corp. and later vice-president and service manager of Pratt & Whitney Aircraft. He joined the organization shortly after his graduation from the Sheffield Scientific School at Yale University.

FREDERICK K. GLYNN of the American Telephone & Telegraph Co. received from the secretary of the Navy the Navy's certificate of award in appreciation of meritorious civilian service. The award was made in recognition of Mr. Glynn's services during the war as automotive equipment consultant to the assistant secretary of the Navy. Mr. Glynn is a former SAE Councilor, and a past-chairman of the Metropolitan Section.

THOMAS N. KELLY, formerly chief engineer of the Stout Research Division of Consolidated Vultee Aircraft Corp., has formed a new organization under the firm name of T. N. Kelly & Co., with offices in Detroit. The primary purpose of this organization, according to the announcement, is to afford to the smaller manufacturers a product design service, equivalent in technical skill and experience to that of the larger corporations.

T. R. DINSMORE has joined the Scientiae Corp. of Dayton, Ohio, where he will be in charge of the design and development of products for commercial markets and also for Wright Field. He was formerly associated with Curtis Pump Co. as chief engineer on the development of a line of fuel booster pumps for the AAF, and also with McCauley Steel Propeller Co., Hamilton Standard Propellers, Frigidaire Division of General Motors and Wright Field. The Scientiae Corp. was formed in 1941 as a tool company which has functioned up to the present time as a tool-designing and tool-making outfit. Mr. Dinsmore heads the newly formed engineering division of the company. Mr. Dinsmore is chairman of SAE Dayton Section.

Formerly automotive engineer with Imperial Oil, Ltd., Toronto, Ont., Canada, **CHARLES E. TILSTON** is now manager of the lubrication sales department of the same firm. Mr. Tilston was 1938-1939 chairman of SAE Canadian Section.

S. FLOYD STEWART has been elected vice-president in charge of engineering of the Leece-Neville Co., Cleveland, Ohio, according to an announcement made by **B. M. LEECE,** president of the concern which has been manufacturing electrical equipment for over 35 years. Mr. Stewart joined Leece-Neville as a research engineer in 1936, becoming chief engineer in 1941. He received a B. S. degree from Washington University in 1922, and followed this with graduate work at M.I.T., receiving an S.M. degree in 1924. Upon his graduation from M.I.T., he completed the test course at the General Electric Co., which led to a position in the motor engineering department.

S. Floyd Stewart

He later joined the engineering staff of the Wagner Electric Corp., and before coming to Leece-Neville was associated with the Jensen Co. of Chicago.

COL. GEORGE A. GREEN, formerly vice-president of GMC Truck & Coach Division, General Motors Corp., Pontiac, Mich., has returned to the United States after five years of government service. For the past year he has been attached to the U. S. Embassy in Rome, Italy, as economic adviser to the ambassador, holding the rank of minister. Currently on leave from the State Department, Colonel Green has made his residence at Miami Beach, Fla.

Col. George A. Green

SAE Members

Vice-Admiral Emory S. Land, whose appointment as president of the International Air Transport Association was announced in the February *SAE Journal*. Admiral Land recently resigned from the U. S. Maritime Commission with which he has served as chairman for eight years

PROF. INZ. **MIECZYSLAW DEBICKI,** who before the war was chief engineer of Panstwowe Zaklady Inzynierji, Warsaw, has been named professor of the Technical High School in Danzig and general manager of the Automotive Research Institute. In a letter to the SAE, he states that technical literature in Poland was completely destroyed in actions of the war and requests catalogs and technical literature published by companies in the automotive industry. Members wishing to send such material to Professor Debicki may address it to him at the Politechnika Gdanska Instytut Samochodwy, Gdansk (Danzig), Poland.

ROBERT P. RUSSELL, executive vice-president and head of the research organization of the Standard Oil Co. of N. J., was awarded the 1946 gold medal of the American Institute of Chemists. In a letter to Mr. Russell, **DR. GUSTAV EGLOFF,** president of the Institute, said that the award was made in recognition of "your genius, not alone as a chemist and chemical engineer, but as an administrator."

Formerly an engineer with Air Products, Inc., Chattanooga, Tenn., **EDWARD DONLEY** is now a designer with the Harding Engineering Co., Detroit.

W. PAUL EDDY, JR., has been appointed chief of engineering operations at Pratt & Whitney Aircraft, division of United Aircraft Corp., East Hartford, Conn. In addition to his former duties as materials engineer, Mr. Eddy now takes charge of the inspection, experimental, and administrative operations of the engineering department. He came to the engineering department of Pratt & Whitney Aircraft in January, 1944, as materials engineer after 15 years of materials work with General Motors Corp. Prior to coming to Pratt & Whitney, he was in charge of metallurgy, welding engineering, and service engineering for GMC Truck & Coach Division.

W. Paul Eddy, Jr.

A. vanDERZEE, vice-president of Chrysler Corp. in charge of sales, has been elected to the Board of Directors of the corporation, **K. T. KELLER,** president, announced recently. Mr. vanDerZee served in the U. S. Navy during World War I and has been in automobile sales work ever since. In 1927 he joined Chrysler Corp. as a special field representative, and subsequently, served as regional manager in Cincinnati and New York. In 1929 he became general sales manager of the Plymouth Division, in 1930 general sales manager of the Dodge Division, and in 1936, vice-president in charge of Dodge sales. In 1938 he became vice-president of Chrysler in charge of all corporation sales, including Plymouth, Dodge, DeSoto, and Chrysler passenger cars and Dodge trucks.

A. vanDerZee

RICHARD HUTTON, chief development engineer, Grumman Aircraft Engineering Corp., has been chosen to receive the Lawrence Sperry Award for 1945, "for his outstanding contributions to the development of carrier-based aircraft." The award, made annually by the Institute of the Aeronautical Sciences for a notable contribution made by a young man to the advancement of aeronautics, was presented to Mr. Hutton at the Honors Night Victory Dinner of the Institute at the Waldorf-Astoria on Jan. 28.

LT.-COL. SIDNEY G. HARRIS has been released from the U. S. Army and has returned to his former position as manager of the sales engineering department, Petroleum Solvents Corp., New York City. He served in the Army for 42 months, of which 32 months were spent overseas as area and theater petroleum officer, U. S. Army Forces, South Atlantic. "For exceptionally meritorious accomplishment . . ." he received a citation from the Commanding General. Colonel Harris is a past-chairman of SAE Metropolitan Section.

SAE members **WILLIAM LITTLEWOOD,** vice-president in charge of engineering, American Airlines, Inc.; **WILLIAM C. LAWRENCE,** chief engineer, American Export Airlines, Inc.; **O. E. KIRCHNER,** director of aircraft engineering, American Airlines, Inc.; **R. W. RUMMEL,** senior engineer, Transcontinental & Western Air, Inc.; **J. C. FRANKLIN,** vice-president of engineering and maintenance, Transcontinental & Western Air, Inc.; and **C. A. RHEINSTROM,** vice-president, traffic, American Airlines, Inc., are taking an active part in the new International Air Transport Association which held its first annual general meeting in Montreal, Que., Canada, last October. Messrs. Littlewood, Franklin, and Lawrence are members of the Technical Committee; Mr. Kirchner is a member of the Accident and Investigation and the Aircraft Maintenance Practices Technical Subcommittees; and Messrs. Lawrence and Rummel are members of the Airworthiness Technical Subcommittee. Mr. Rheinstrom is chairman of the Traffic Committee.

HOWARD G. VESPER has become president of California Research Corp., San Francisco, a subsidiary of the Standard Oil Co. of Calif. Manager of the gasoline and fuel oil division in Standard's marketing department since 1942, Mr. Vesper brings to his new position a unique combination of research background and marketing experience. He joined Standard shortly after his graduation from C.I.T. with a B.S. degree in chemical engineering in 1922. He was soon raised to shift operator at the El Segundo experimental laboratory and later to research chemist. Before being transferred to San Francisco in 1931, he served as assistant foreman and then foreman in the research and development department. With new products as his specialty, Mr. Vesper next was staff and general assistant in research and development. His ability to combine technical knowledge with an aptitude for selling brought about his transfer to a position as technical salesman in New York City for the foreign trade and sales department. Returning to

Howard G. Vesper

E. V. Farrar

Kenneth Campbell

New changes at Wright Aeronautical Corp., Paterson, N. J., include the appointment of **E. V. FARRAR** as manager of the Gas Turbine Division and the appointment of **KENNETH CAMPBELL** as manager of the Research Division. Mr. Campbell, recipient of the 1944 Manly Medal and the 1944 Wright Brothers Medal, joined Wright in 1933. His first assignment was to conduct applied research on the air cooling of engines and other heat transfer problems. These investigations were shortly expanded to include supercharging, induction, and combustion research. Mr. Farrar first joined Wright in the summer of 1928 as a layout draftsman. He returned to Wright in 1929 and has since worked on engine layout, test equipment design, as an engineer assigned to supercharging, cylinder structure, and also as stress analyst and chief of the Materials Laboratory. From 1926 until 1929 he taught descriptive geometry and mechanical drawing at Purdue University.

San Francisco, he spent two years as assistant manager of the lubricant division and in 1940 was named manager.

NILE E. FAUST has recently joined the Elliott & Peterson Co., as a partner and vice-president in charge of service and parts. Major Faust, recently discharged from the USAAF, was on terminal leave until Feb. 24. Before the war he was a representative for the Chrysler Corp. in Maine, New Hampshire, and Vermont, contacting dealers in this area on Chrysler, DeSoto, Dodge, and Plymouth cars, trucks, and diesel engines. He started with Chrysler in 1937 after working at Ford Motor Co. for two years. He joined Ford shortly after graduation from the University of Pittsburgh in 1935. His Army experience dates from July, 1942, when he entered the Army as a second lieutenant. Since then his time has been spent in New England at various air bases where he was in charge of aircraft repair and also car and truck maintenance.

Nile E. Faust

HAROLD ROBINSON has become general superintendent of tractor manufacturing and assembly at Ford Motor Co. He joined Ford in 1922 and has since served as superintendent of the Lincoln plant.

Harold Robinson

W. WILBUR SHAW has been elected president and general manager of the Indianapolis Motor Speedway Corp., Indianapolis, Ind. He was previously director of sales and engineering of the Firestone Aircraft Co., Akron, Ohio. He is one of two three-time winners of the Indianapolis Sweepstakes. Mr. Shaw succeeds **CAPT. EDWARD V. RICKENBACKER** as president.

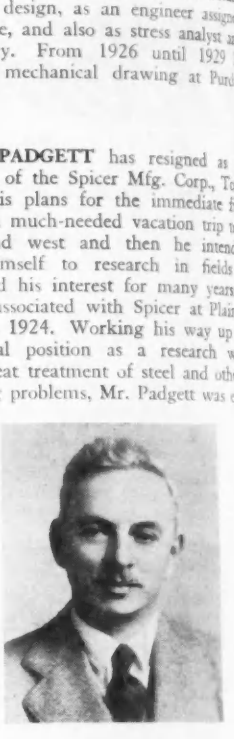
W. Wilbur Shaw

ROSS T. GUY is now production manager of Collett-Sproule, Ltd., Toronto, Ont., Canada. He was formerly project engineer, General Motors of Canada, Ltd., Oshawa, Ont.

H. PAUL CLEAVER, works manager of the Fuller Brush Co., Hartford, Conn., has been elected to the board of directors of that firm. Prior to joining the Fuller organization as works manager in June, 1943, he held a similar position for 11 years with the J. G. Brill Co., Philadelphia. A native of Wilmington, Del., Mr. Cleaver majored in engineering at the University of Delaware and Cornell University. After completing his engineering studies, he joined the Bethlehem Shipbuilding Corp. In August, 1926, he became assistant superintendent of the Philadelphia plant of the Brill Company, and six years later became works manager there.

H. Paul Cleaver

J. E. PADGETT has resigned as vice-president of the Spicer Mfg. Corp., Toledo, Ohio. His plans for the immediate future include a much-needed vacation trip to the south and west and then he intends to apply himself to research in fields that have held his interest for many years. He became associated with Spicer at Plainfield, N. J., in 1924. Working his way up from his initial position as a research worker in the heat treatment of steel and other engineering problems, Mr. Padgett was elected a vice-president of the company in 1937. He was graduated from Worcester Polytechnic Institute where he specialized in automotive engineering. Mr. Padgett is a past-vice-chairman representing the Production Engineering Activity Committee.



J. E. Padgett

FREDERICK M. PAULL has joined the staff of Bishop, McCormick & Bishop, New York City. He has recently been discharged from the U. S. Army, with which he had been serving as a lieutenant-colonel as chief of maintenance, covering combat vehicles, automotive equipment, artillery, fire control instruments, and Quartermaster equipage and small arms. In his new position, he will be general service and parts manager covering all branches in Manhattan and Long Island.

Frederick M. Paull

Recently appointed as vice-presidents of Continental Motors Corp., **PALMER C. DOLPH** has been raised to assistant sales manager of the Automotive Division and **C. WHEELER JOHNSON** has been placed in charge of the newly created general service and distributor sales department. Vice-president Dolph, who has had charge of important territory west of Chicago, handling many of Continental's largest transportation and industrial accounts, has been with the organization for 30 years. He acted as service manager of the Automotive Division for nearly six years before going into sales engineering five years ago. Vice-president Johnson, who had been on special assignment work with the firm's national distributor organization, will, as head of the general service and distributor department, coordinate all service activities in connection with the company's large industrial customers. In addition, he will also have charge of all service and sales promotion activities on industrial power units and transportation engines as they relate to distributors.

J. R. ROSE has been named assistant sales manager of the Automotive Equipment Division of the Wagner Electric Corp. Associated with the Wagner organization

J. R. Rose

for more than 20 years, Mr. Rose has long been connected with the handling of the various functions of the company's electrical and automotive service departments.

LESTER L. BELTZ and **HOWARD G. REED** have recently joined the engineering department of the Ford Motor Co., Dearborn, Mich. Mr. Beltz, an electrical engineer, comes to Ford from Packard Motor Car Co. Prior to that he served with the Studebaker Corp. and with Reo Motor Co. Mr. Reed, a chassis engineer, comes to Ford after association with Buick Motor Division, Willys-Overland Motors, Inc., and Packard. During the war he served as assistant administrative engineer at Packard's Toledo plant.

Appointment of Palmer C. Dolph and C. Wheeler Johnson as vice - presidents of Continental Motors Corp. was announced recently by C. J. Reese, president

Palmer C. Dolph

C. Wheeler Johnson

Previously factory superintendent, Pedlar People, Ltd., Oshawa, Ont., Canada, **MILTON H. HODGSON** has recently been named manager of the Toronto branch of

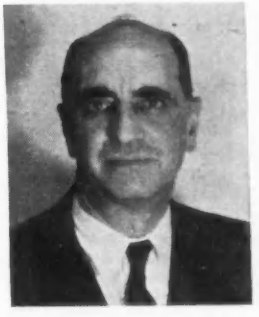
R. J. BUTTNER has been named professor of automotive engineering in the graduate school at Purdue University, West Lafayette, Ind. Mr. Buttner comes to Purdue from Packard Motor Car Co. where he had been in charge of Research and Development Laboratory facilities. Before joining Packard, he was for many years associated with various divisions of General Motors Corp. As powerplant engineer for the aircraft development section of Fisher Body Division, he was responsible for all problems involved in the engine installations in aircraft. Just prior to that, from 1936 to 1943, he served with Allison Division. Before that, for one year, he was project engineer on a two-cycle diesel engine for use in aircraft. He conducted experimental design studies on high speed printing presses which are now in wide use while he was press designer with the Goss

R. J. Buttner

Printing Press Co., Chicago. He received the degree of Bachelor of Science in Mechanical Engineering from Purdue University in 1931.

W. L. GARTNER is now owner and manager of Gartner Motors, Coffeyville, Kans. He was formerly AAF-ATSC administrative procurement inspector, USAAF, North American Aviation, Inc., Kansas City, Kans.

JAMES G. TURTON, with offices in New York City, has been appointed resident U. S. A. technical representative for the Automotive Products Co., Ltd., Leamington Spa, England. During the six war years he was engaged in the United States and Canada as technical adviser to manu-



James G. Turton

facturers on this continent of his firm's hydraulic products in connection with tanks, aircraft, submarines, and merchant vessels. His future interests will mainly concern the introduction to his associates of further lines for manufacture and distribution in the British Empire and Europe.

Sketches and thumbnail biographies of SAE members **WALTER H. BEECH,** president and chairman, Beech Aircraft Corp.; **DWANE L. WALLACE,** president, Cessna Aircraft Co.; **ALBERT W. MOONEY,** chief designer and vice-president, Culver Aircraft Corp.; **FRED E. WEICK,** vice-president in charge of engineering, Engineering and Research Corp.; **LEROY R. GRUM-**

L. S. Barksdale, formerly vice-president in charge of engineering and sales of the Saval Co., Los Angeles, has assumed complete charge of the Hydraulics Division. L. M. Smith has been appointed general sales manager in charge of both aircraft and industrial sales and H. C. Trich, formerly assistant chief engineer, has been promoted to the position of chief engineer

L. S. Barksdale

H. C. Trich

L. M. Smith

Lt.-Col. Benjamin F. Hake (top, right) and Com. Clarence J. Livingstone (bottom, right) are shown receiving the Legion of Merit from Brig.-Gen. Howard L. Peckham

MAN, president, Grumman Aircraft Engineering Corp.; and **ALFRED MARCHEV,** president, Republic Aviation Corp., are included in "Radio Sketchbook of Personal Aviation," a brochure just released by the Radio Division of Bendix Aviation Corp. Also featured in the booklet are sketches of the airplanes the leading aircraft companies are building and descriptions of how radio adds to the convenience and enjoyment of personal flying.

JOHN A. KANY has become project engineer in the Lincoln Motor Car Division of Ford Motor Co., Dearborn, Mich. He was formerly automatic cannon engineer with the Chrysler Corp., Detroit.

John A. Kany

H. H. KELLY, regional director, European Central Inland Transport Organization, has opened the ECITO office for the United States and Canada in the Grafton Annex, 1935 DeSales St., Washington 6, D. C. The organization, which has 12 member foreign Governments in participation with the United States, is to provide for coordination in traffic movement and allocation of transportation equipment and material with view to ensuring the best possible movement of supplies in Europe. From 1943 to 1945, Mr. Kelly was director of materials and equipment for the ODT.

LT.-COL. BENJAMIN F. HAKE and **COM. CLARENCE J. LIVINGSTONE,** both of the staff of the Fuels and Lubricants Division of the Office of the Quartermaster General, Washington, D. C., have been decorated with the Legion of Merit for their contributions to the adequate provision of fuels and lubricants to American and Allied land armies during the war. Before entering the Army, Colonel Hake was division geologist for the Gulf Refining Co., and had previously explored for oil in Mexico and Canada, as well as in many locations in this country. He was assigned as staff geologist, Headquarters, Northwest Service Command when he entered the Service, and later came to the Quartermaster Corps in August, 1943, as chief of the Planning Branch, F&L Division. Commander Livingstone, although commissioned in the Naval Reserve, was on assignment to the F&L Division's Technical Branch. He came to the Division about the same time as Colonel Hake, and at the time of his relief from active duty in October, 1945, was chief of the Standards and Specifications Section of that branch. Prior to entering the Service, he spent five years as chief automotive engineer with the Gulf Research & Development Co., and for 12 years before that was with the Mellon Institute of Industrial Research on a petroleum fellowship supported by Gulf.

E. F. NASON, who was associated with Pratt & Whitney Aircraft in East Hartford and Kansas City, is now affiliated with the Elastic Stop Nut Corp. of America, Union, N. J., as service engineer. In this capacity he will coordinate development of high temperature and high tensile lock nuts for use in the aircraft industry. Mr. Nason was vice-chairman for aeronautics of the SAE Kansas City Section in 1944-1945.

Formerly service representative, United Aircraft Service Corp., East Hartford, Conn., **SIMON T. MITCHINER, JR.,** is now powerplant installation and operation engineer with Pan American-Grace Airways, Inc., New York City.

Formerly supervisor, central production control office, Aircraft Engine Division, Packard Motor Car Co., Detroit, **ROBERT S. JONES** is now associated with the Fruehauf Trailer Co., where he is serving in the planning department.

CHARLES H. LOFTHOUSE has become associated with the Jackson Kedyie Motor Co., Chicago, dealers for Chrysler, Dodge, and Plymouth cars. For the past five years, Mr. Lofthouse was an engineer on special assignment with the Packard Motor Car Co., Detroit.

Charles H. Lofthouse

Davisbilt Representative

Walter S. Peper

WALTER S. PEPER has formed the Walter S. Peper Co., 11 East 48 St., New York, to represent the Davisbilt Products Co., Cincinnati, manufacturers of "Davisbilt" truck and trailer tanks. The activity of the new company will embrace both the sales efforts of the eastern distributor organization and sales to major oil company and national accounts. Mr. Peper has been a member of the Society since 1919; SAE Metropolitan Section chairman, and has served on various committees. He is a licensed professional engineer and has served in engineering and sales executive positions with Yellow Coach; Curtiss-Wright Corp.; Bellanca Aircraft Corp.; Gulf Oil Corp.; Bendix-Westinghouse (Smith & Gregory, New York), and during the war period as vice president and chief engineer of Canadian American Truck Co., contractors for Army Ordnance.

MARVIN J. PARKS has been appointed export manager of Fairchild Engine & Airplane Corp. He will make his headquarters in Washington, D. C. A former airline pilot and test pilot, Mr. Parks has been associated with the Fairchild Aircraft Division in Hagerstown, Md., and for the past year has been an executive on the C-82 Packet project. Prior to joining Fairchild in February, 1945, he was assistant

Marvin J. Parks

director of contracts with Curtiss-Wright Corp. He came to Curtiss-Wright in 1940 as chief test pilot of the St. Louis plant. Three years after he had learned to fly at Parks Air College, St. Louis, in 1928, he had accumulated 1500 hr in private and commercial flying, demonstration, and test flights. In 1931 he joined Pan American Airways, Inc., as a pilot for Panagra based at Lima, Peru. Two years later, he was made divisional maintenance engineer of Panagra's southern division, based at Santiago, Chile. He returned to the United States in 1936 and for the next two and one-half years he was a pilot with American Airlines, Inc.

PIERRE J. MAUCK has recently been named general director of engineering, Fisher Body Division, General Motors Corp., Detroit. He was formerly chief engineer of the same division.

LT.-COM. CHARLES H. MARTENS, USNR, who had formerly been on the aviation material staff in the Marshall Islands, has been transferred to a naval air station in the Marianas Islands where he is executive officer.

Formerly an engineer with Bell Aircraft Corp., Niagara Falls, N. Y., **E. CHARLES CURTIS, JR.**, is now in the technical advisory service of Revere Copper & Brass, Inc., Detroit.

J. A. THOMAS, Manila Electric Co., has been transferred from the New York City branch of the firm and will serve in Manila, P. I.

Formerly senior engineer, Transcontinental & Western Air, Inc., Kansas City, Mo., **HAROLD R. PORTER** is now senior products engineer with the Standard Oil Co. of Calif., San Francisco.

Previously chief engineer, **BERNARD J. VIERLING** has recently joined Pennsylvania Central Airlines, Washington, D. C., as director of engineering and maintenance.

TED E. DANIELS is now serving as an engineer with the Dan Brad Co., South Bend, Ind. He was formerly liaison engineer, Bendix Products Division, Bendix Aviation Corp., same city.

Formerly experimental equipment engineer, Wright Aeronautical Corp., Paterson, N. J., **ROBERT K. WINKLEBLACK** is now engineering editor of *Automotive and Aviation Industries*, published by the Chilton Co., Inc., Philadelphia.

Formerly chief powerplant engineer, **LESLIE T. MILLER** is now chief of the propulsion research and development section of the Glenn L. Martin Co., Baltimore, Md.

RALPH L. JOHNSTON, formerly designer with the Aluminum Alloys Corp., Detroit, is now head of his own firm, the Johnston Permanent Mold Design Co., same city.

Previously service manager, Martin-Berrigan Pontiac, Inc., New York City, **JOHN A. VAUGHAN** is now foreman, Myrtle Motors, same city.

Until recently design engineer, Wright Aeronautical Corp., Paterson, N. J., **O. GUY BURFORD** is now serving in a similar capacity with Reynolds Metals Co., Richmond, Va.

WILLIAM F. SCHICK, JR., is now research engineer in the Mechanical Packings Division of the Johns-Manville Corp., Manville, N. J. He was formerly sales engineer with Curtiss-Wright Corp., Propeller Division, Caldwell, N. J.

GEORGE L. N. MEYER has been elected president of the Geo. J. Meyer Mfg. Co., Cudahy, Wis., manufacturers of bottling equipment. He was formerly a vice-president of the firm.

Previously senior layout draftsman, experimental engineering department, Sikorsky Aircraft Division, United Aircraft Corp., Bridgeport, Conn., **HARRY S. EGERTON** is now design engineer with McDonnell Aircraft Corp., Helicopter Research Division, St. Louis, Mo.

Formerly diesel engineer, General Motors Overseas Operations, New York City, **MICHAEL MARVOSH** is now general service manager of Caribe Motors Corp., San Juan, Puerto Rico.

THEODORE H. NAGLE has been named director of sales and advertising, Hydraulic Machinery, Inc., Dearborn, Mich. He was previously connected with Sav-Way Industries, Detroit, where he served in a similar capacity.

Formerly assistant project engineer, Wright Aeronautical Corp., Paterson, N. J., **WILLIAM R. NEELY** is now project engineer working on powerplants with American Airlines, Inc., Jackson Heights, L. I., N. Y.

DOUGLAS McGREGOR has been named executive vice-president of the Pierce Governor Co., Inc., Anderson, Ind., manufacturers of governors, automatic chokes, and controls.

LEONARD W. REEVES recently became general manager of the main plant of Thompson Products Inc., Cleveland, Ohio. He was formerly vice-president and general manager of Toledo Steel Products Co.

Formerly assistant supervision engineer, Fisher Body Division, General Motors Corp., Detroit, **MELVIN E. VanSICKLE** is now sales engineer with Delco Radio Division of General Motors in Kokomo, Ind.

WALTER A. WOOD, JR., is now associated with the R. K. LeBlond Machine Tool Co., Cincinnati, Ohio, as an engineering draftsman.

J. F. MAXWELL is now sales manager of Roadmaster Products Co., Chicago, manufacturers of vacuum power brakes and butane carburetors. He had been in the service section of the Cleveland Tractor Co. as a civilian technician, USAAF.

B. C. ERICKSON, formerly research engineer, Borg-Warner Corp., Research Laboratory, Detroit, is now serving in the automotive research department of the Ford Motor Co., Dearborn, Mich.

DONALD J. NAUMANN has been appointed chief engineer, Brown Aircraft Co., Montebello, Calif. He was formerly president of the Naumann Aircraft Corp., Los Angeles.

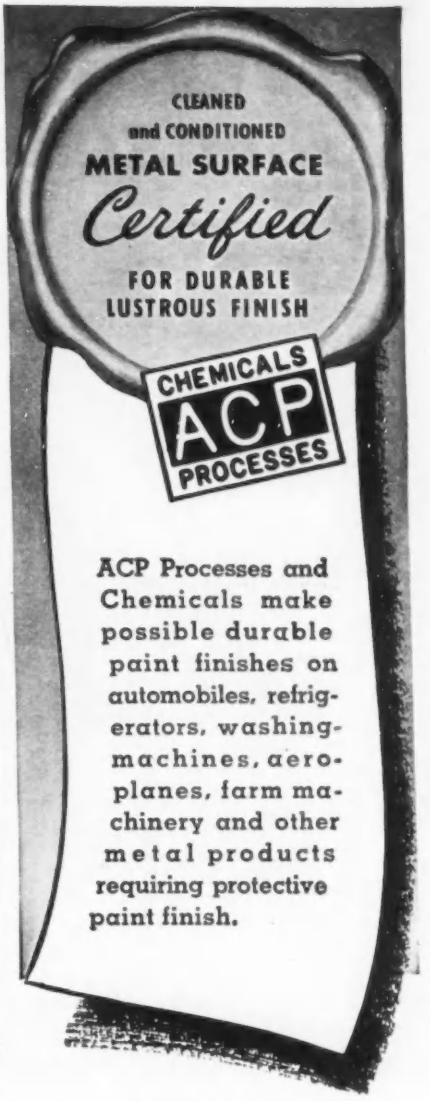
JOHN W. SUTCLIFFE has started his own company, "Ruahine," Surrey, England, and will concentrate on the manufacture of radio sets. During the war, Mr. Sutcliffe was assistant chief engineer, Air Transport Auxiliary, White Waltham Air Field, Berkshire, England.

Previously research engineer with General Motors Corp., Detroit, **GLEN A. SMITH** has been transferred to General Motors Do Brasil, Sao Paulo, Brasil, where he is serving as chief engineer.

I. F. VELTUM, formerly production superintendent, U. S. Army, Ordnance Service Command Shop, Chicago, is now general manager of Burkitt Motor Sales, Park Ridge, Ill.

Previously development engineer, Continental Motors Corp., Muskegon, Mich., **MARION C. TRAVIS** is now an engineer with the J. I. Case Co., Racine.

HAROLD F. SUTHERS is now chief of the development and engineering experimental department, American Machine & Foundry Co., Buffalo, N. Y. He was for-



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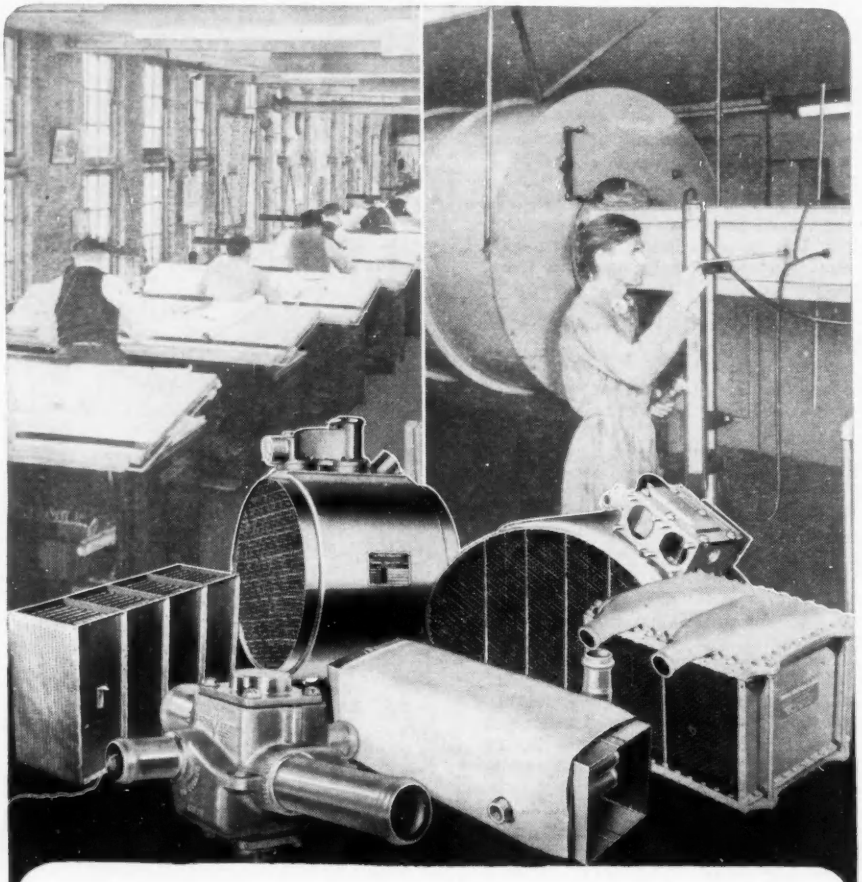

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merly chief test engineer, Houde Engineering Division, Houdaille-Hershey Corp., same city.

Formerly chief engineer Leyhe Mfg. Co., Burbank, Calif., **HAROLD E. KOESTER** is now design and layout engineer, Righter Engineering Co., Glendale, Calif.

CHARLES M. JAMIESON, who had been design engineer with the Culver Aircraft Corp., Wichita, Kans., is now serving in a similar capacity with the Beech Aircraft Corp., same city.

WILFRED A. SMITH, technical representative, B. F. Goodrich Co., has been transferred from the Washington, D. C., branch of the firm to Akron, Ohio.

Formerly instruments and control engineer, Cochrane Corp., Philadelphia, **HARRY B. RATH** is now an engineer in the industrial controls section of Leeds & Northrup Co., same city.

CHARLES S. DRAPER, professor of aeronautical engineering in charge of instrumentation at M.I.T., received the Sylvanus Albert Reed Award for 1945, "for application of the gyroscope to computing sights for gunnery and to other computing devices." The award, presented to Professor Draper at the Honors Night Victory Dinner of the Institute of the Aeronautical Sciences on Jan. 28, is given annually by the Institute for a notable contribution to the aeronautical sciences resulting from experimental or theoretical investigations.

Formerly director of research, **KARL K. PROBST** has recently been appointed chief engineer of Reo Motors, Inc., Lansing, Mich.

HAROLD R. UHRICH, who had been chief engineer, Sensenich Bros., Lititz, Pa., is now an aeronautical engineer in the stress department, Platt-Le Page Aircraft Co., Eddystone, Pa.

ELDON J. KELLEY, formerly branch manager, Valley Equipment Co., San Jose, Calif., is now a consultant on construction, logging, and mining equipment with offices in San Francisco.

JOHN O. McREYNOLDS has been appointed general manager of Electronics, Inc., South Pasadena, Calif., manufacturers of electronic meters and devices. He was formerly chief technologist with Thompson Products, Inc., Inglewood, Calif.

Formerly junior engineer with Joshua Hendy Iron Works, Sunnyvale, Calif., **KENNETH U. MEGUIRE** is now associated with the Enterprise Engine & Foundry Co., San Francisco. In his new position, Mr. Meguire is in charge of the Export Division of the firm.

Previously chief engineer with the Austin Tool & Mfg. Co., Cleveland, **TRACY F. BRACKETT** is now affiliated with the Ex-Cell-O Corp., Detroit.

FINLEY B. MYERS, SR., who had formerly been regional automotive specialist, War Production Board, New York City, is now manager of Long Island Willys, Inc., Brooklyn, N. Y.

MELVIN N. OSBORN is now associated with the Indiana Glass Co., Dunkirk, Ind., as assistant plant engineer.

Formerly inspector, U. S. Navy Department, Inspection of Naval Material,

CHARLES SUNTAG is now quality control engineer, Navy Department, New York City.

Previously in the development engineering department of the Aluminum Co. of America, Cleveland, **JOSEPH S. POLLACK** is now sales engineer with the Reynolds Metals Co., Louisville, Ky.

WILLIAM G. REID has recently joined the Wyatt Ragsdale Corp., Detroit, as office manager. He was formerly an engineer in the aircraft engine section of Briggs Mfg. Co., Conner Engine Laboratory, Detroit.

CALVIN G. WATERS is now manufacturing sales manager of the Wico Electric Co., West Springfield, Mass. He was formerly midwest district manager of the same company with headquarters in Chicago.

Formerly liaison engineer, Bendix Aviation Corp., Pacific Division, North Hollywood, Calif., **J. C. ARMELING** is now serving in an engineering capacity with Northrop Aircraft, Inc., Hawthorne, Calif.

GERALD W. BAKER has been named chief engineer of the M and E Mfg. Co., Indianapolis, Ind., manufacturers of industrial spray booths and equipment. He was formerly chief draftsman with Lukas-Harold Corp., same city.

W. ANDREW ASHTON is now chief engineer and owner of Andrew Ashton & Associates, Los Angeles, consulting and design engineers.

PAUL BEAUCHAMP, formerly manager of Bowes "Seal Fast" Co., Ltd., Hamilton, Ont., Canada, has been transferred to the Los Angeles branch of the same firm, the Bowes "Pacific" Corp., where he is manager and vice-president.

Previously chief engineer, Reid Products Division, Standard Products Co., Cleveland, **JOHN W. BAUER** is now an engineer with the John P. Cochran Co., same city, manufacturers of paint and varnish.

JOHN H. BRADER has been appointed president and manager of Heil-Chicago, Inc., distributors for the Heil Co., Milwaukee, of bodies, hoists, and tanks. He was formerly assistant chief engineer for the Hendrickson Motor Truck Co., Chicago.

Formerly general superintendent, American Bosch Corp., Providence, R. I., **JOHN BOUWMEESTER** is now affiliated with the Indiana Steel Products Co., Valparaiso, Ind.

F. FRANCIS DONOGHUE is now a research engineer with the Worthington Pump & Machinery Corp., Holyoke, Mass. He formerly served in a similar capacity with the Reed-Prentice Corp., Worcester, Mass.

Previously aerodynamicist with the Glenn L. Martin Co., Middle River, Md., **JOHN L. SENIOR, JR.,** is now associated with Northeast Airlines, Inc., East Boston, Mass.

DONALD J. AYERS, who had been development engineer with Bendix Products Division, Bendix Aviation Corp., South Bend, Ind., is now chief engineer with Quality Spring Products, Inc., Coldwater, Mich.

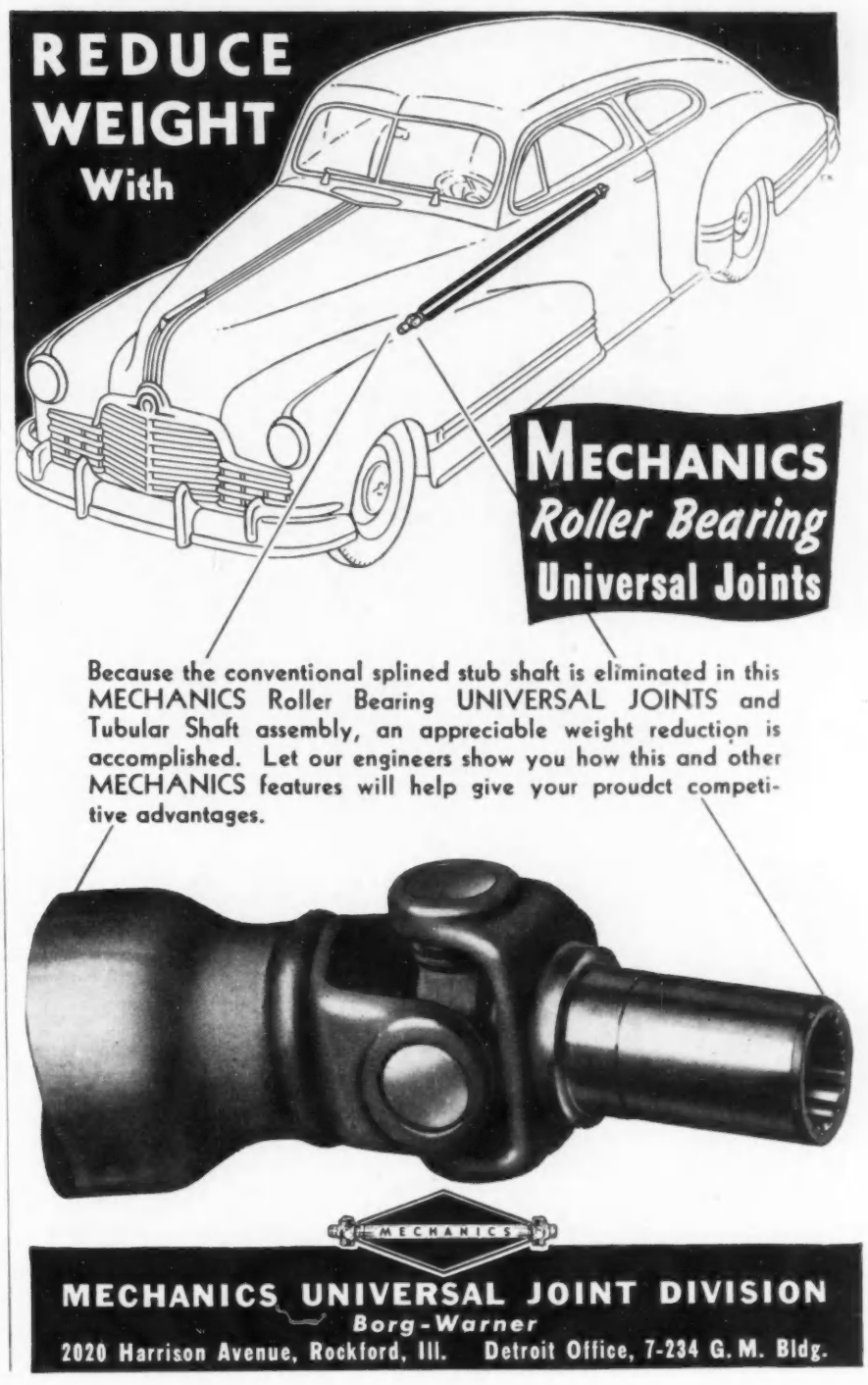
SETH E. ALDRIDGE has recently joined Westwood Motors, Inc., West Los Angeles, Calif. He was formerly district manager and service representative, Buick Motor Division, General Motors Corp., Flint, Mich.

Formerly assistant design development engineer, Sikorsky Aircraft Division, United Aircraft Corp., Bridgeport, Conn., **OLEG J. DEVORN** is now associated with Northrop Aircraft, Inc., Hawthorne, Calif.

CARSON E. DALTON has been appointed to the staff of the vice-president and general manager of the Chrysler Corp., Detroit. He was previously chief liaison executive, Dodge Chicago Plant, Chrysler Corp., Chicago.

Formerly mechanical engineer with Thompson Products, Inc., Aircraft Accessories Division, Cleveland, **EUGENE N. DOUBRAVA** is now serving in a similar capacity in the Parts and Accessories Division of Thompson Aircraft Products Co., Euclid, Ohio.

Formerly chief tool designer, Sperti, Inc., Cincinnati, Ohio, **WILLIAM RICHARDS** is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now development engineer with A. H. Ross & Co., Ludlow, Ky.

MARK C. NICHOLSON, who had been test leader, model test department, Dodge Chicago Plant, division of the Chrysler Corp., is now field service representative, Buda Engine & Equipment Co., New York City.

JOSEPH JANDASEK is now head of fluid torque converter development as project engineer of the Chrysler Corp. He was previously turbo engineer for Bendix Aviation Corp., Detroit.

Formerly project engineer, Lycoming Division, Aviation Corp., Williamsport, Pa., **LLOYD D. BEVAN** is now powerplant staff engineer at Bell Aircraft Corp., Buffalo, N. Y.

Previously engineer with the Curtiss-Wright Corp., Buffalo, N. Y., **PAUL F. GROVES** is now design engineer in the research department of the DeLaval Co., Gas Turbine Division, Trenton, N. J.

WILLIAM L. CROWE has recently joined the Moore Equipment Co., Stockton, Calif., as service manager. He formerly was service representative, Detroit Diesel Engine Division, General Motors Corp., Detroit.

KENNETH D. REED is now a mechanical engineer in the Door Division of the Barber-Colman Co., Rockford, Ill., manufacturers of textile machinery. He was previously associated with Wright Aeronautical Corp., Lockland, Ohio, as senior liaison engineer.

Formerly supervisor, test equipment department, Wright Aeronautical Corp., Paterson, N. J., **ERNEST M. ROEBER** is now a mechanical engineer with Lederle Laboratories, Pearl River, N. Y. The Lederle organization specializes in pharmaceutical and biological research.

JOHN R. SCHMITT has been named head fuel and lubricant engineer of the Standard Oil Co. of Calif., Los Angeles. He was formerly automotive engineer in the San Francisco branch of the same firm.

Formerly junior engineer, Chrysler Corp., Highland Park, Mich., **JOHN G. McQUAID** is now chassis engineer with the Ford Motor Co., engineering division, Dearborn, Mich.

LT. FILO H. TURNER, JR., USNR, who had been stationed aboard the U.S.S. Langley, Fleet Post Office, San Francisco, may now be reached at the Naval Air Test Center, Patuxent River, Md.

Formerly field service engineer, Boots Aircraft Nut Corp., New Canaan, Conn., **WILLIAM N. DAVIDSON, JR.,** is now technical field service engineer with GMC Truck & Coach Division, General Motors Corp., New York City.

WILLARD R. BEYE has joined Transcontinental & Western Air, Inc., Kansas City, Kans., as senior engineer working on powerplants. He was assistant project engineer, Hamilton Standard Propellers, division of United Aircraft Corp., East Hartford, Conn.

FREDERICK H. ROEVER has recently joined the J. P. Riddle Co., Coral Gables, Fla., as chief instructor of the Riddle Aviation School. The Riddle Co. operates Escola Técnica de Aviacao of Sao Paulo, Brazil, for which the Riddle Aviation School serves as an instructor training center.

COL. WILLIS S. WELLS, SR., who for the past four years has been with the Ordnance Department, U. S. Army, has been returned to civilian life and is at present at the William Penn Hotel, Los Angeles.

Formerly foreman, municipal garage, City of Milwaukee, Wis., **LEO G. WRIGHT** has recently been named automotive mechanic supervisor, Bureau of Municipal Equipment, Milwaukee.

RAYMOND W. SCHEUBEL has recently been named chief engineer of the International Projects Corp., New York City.

HARRY E. CHEW, Pullman-Standard Car Mfg. Co., Chicago, has been named plant engineer. He was formerly chief liaison engineer in the Aircraft Division of the same firm.

Formerly research engineer, Kendall Refining Co., Bradford, Pa., **WILLIAM R. MUNFORD** is now associated with the Continental Aviation & Engineering Corp., Muskegon, Mich.

G. M. MAGRUM is now vice-president in charge of manufacturing with the Mundet Cork Corp., Brooklyn, N. Y. He was formerly research manager in Houde Engineering Division, Houdaille-Hershey Corp., Buffalo, N. Y. Mr. Magrum was 1940-1941 chairman of SAE Buffalo Section.

JOHNSON manufactures Hydraulic Tappets, Self Locking Adjustable Tappets, and conventional Adjustable Tappets... JOHNSON builds tappets to your designs and specifications... Let JOHNSON assist you in your tappet design problems.

(The above illustration is a sectional and exploded view of JOHNSON Hy-Precision Hydraulic Tappet.)

JOHNSON PRODUCTS, INC.
MUSKEGON HEIGHTS, MICHIGAN

Previously design engineer, Willys-Overland Motors, Inc., Toledo, Ohio, **RAYMOND W. DROBISCH** has recently joined the Swartzbaugh Mfg. Co., same city, as chief development engineer.

HAL H. McKINNEY, who had been chief engineer in the Texas Division of Continental Motors Corp., Dallas, Tex., is now an engineer with the Otis Engineering Corp., same city.

WILLIAM F. MAQUIRE has been named director of industrial development of the Lily-Tulip Cup Corp., New York City. He was formerly training director, Wright Aeronautical Corp., Paterson, N. J.

Previously project engineer, Fisher Body Division, General Motors Corp., aircraft development section, Detroit, **GEORGE K. McCANN** is now project engineer with Ford Motor Co., Automotive Research Division, Dearborn, Mich.

VAN WYCK HEWLETT has recently joined Francis & Sons, Brooklyn, N. Y., as an engineer. Previously he was checker in the engineering department of the Columbia Aircraft Corp., Valley Stream, L. I., N. Y.

CHARLES E. CONOVER has been named sales manager of the Industrial Division, Resistoflex Corp., Belleville, N. J. He was formerly assistant chief engineer with the same company.

Formerly junior design engineer, Lockheed Aircraft Corp., Burbank, Calif., **JOSEPH J. PETERSON** is now design engineer with Menasco Mfg. Co., same city.

T. G. TIMBERLAKE is now associated with the Shell Oil Co., Inc., Research Laboratory, Wood River, Ill., where he is serving in the capacity of research engineer.

Formerly general manager of Lake Shore Stage Lines, Tacoma, Wash., **ROBERT L. SCOTT** is now safety engineer and auditor for the United Pacific Insurance Co., Seattle.

GEORGE A. JOHNSON is now senior engineer with Smith, Hinchman & Grylls, Detroit, architects and engineers. He was formerly a mechanical engineer, U. S. Army, Office of the Chief of Ordnance-Detroit.

B. ALLISON GILLIES is now an aviation consultant with offices in San Diego, Calif. Mr. Gillies was formerly assistant to the president and director of light and service, Ryan Aeronautical Co., same city.

Previously design engineer, Worthington Pump & Machinery Corp., Holyoke, Mass., **WALDEMAR O. BISCHOFF** is now associated with B. F. Perkins & Son, Inc., same city, in a similar position.

Formerly a laboratory engineer with the Chrysler Corp., Detroit, **LOREN C. SACKETT** is now enrolled at the Graduate School of Business Administration at Stanford University, Calif.

G. A. JOHNSON, who had been chief engineer, has been named sales manager of the Rochester Products Division, General Motors Corp., Rochester, N. Y.

Formerly technical representative, Ranger Aircraft Engines, Farmingdale, L. I., N. Y., **ALAN D. MORTON** is now associated with McRae Bros., Huntington Station, L. I., N. Y.

I. E. ROSS, JR., has recently joined Victor Electric Products, Inc., Cincinnati, Ohio, as assistant chief engineer. He was formerly technical adviser, Aircraft Electrical Council, National Electrical Manufacturers Association, New York City.

Formerly technical adviser, USAAF, Headquarters, Air Technical Service Command, engine maintenance section, Wright Field, Dayton, Ohio, **C. M. CHASTAIN** is now chief engine inspector, ATSC, Kelly Field, San Antonio, Tex.

HAROLD M. DAVIS has been elected president of the Aero-Coupling Corp., Burbank, Calif. Mr. Davis, who is also manager of the west coast plant of Seaman Products, a division of the Seaman Paper Co., was formerly executive vice-president of the Aero-Coupling organization.

Previously assistant mechanical engineer, National Advisory Committee for Aeronautics, Cleveland, **FRANCIS H. COE** is now diesel layout engineer, Baldwin Locomotive Works, Eddystone, Pa.

JOHN B. CRANE has been elected president of Transportation Analysts, Inc., Washington, D. C., specialists in transport service and research. Mr. Crane was formerly director of economic research with the Glenn L. Martin Co., Baltimore, Md.

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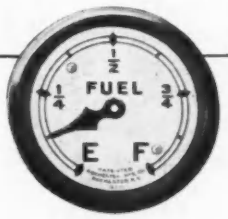
A tractor equipped with a Rochesrer Fuel Level Gauge forestalls lost time and delays. It is the only way to prevent running out of fuel when the farmer is miles from his source of supply Specify Rochester Fuel Level Gauges for accuracy and visibility.



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OBITUARIES

B. E. Sibley

B. E. Sibley, 59, chief technologist for Continental Oil Co., Ponca City, Okla., died at 2:30 a.m., Feb. 13, at Needles, Calif. He had been ill for several months.

Mr. Sibley had resided in Ponca City since February, 1930, when he went there from Denver as chief technologist in the marketing department at Continental. Born in Warsaw, Pa., he devoted much of his early life to the development of the automobile and was active in automobile racing circles. He joined Continental as a salesman in Colorado in 1912, and spent 17 years in direct sales work with that company before his appointment as chief technologist on Sept. 1, 1929.

Active in SAE, Mr. Sibley served as 1938 vice-president of the SAE Fuels and Lubricants Activity and as a member of the Cooperative Research Council, and other technical committees. In his capacity as a member of the CRC War Advisory Committee, he made outstanding contributions to the development of fuels and lubricants of the War Department. He was also a member of the American Society of Mechanical Engineers.

He is survived by his wife, Mrs. Gwen Sibley, and his daughter, Mrs. Gene Hoekhne. Funeral services will be held at Ponca City. Final arrangements have not yet been completed.

Lloyd P. Lochridge

Lloyd P. Lochridge, manager of domestic lubricating oil sales for the Sinclair Refining Co., New York City, died Jan. 10 at the age of 56.

Mr. Lochridge was made manager in the Sinclair organization in 1919 for the Texas division and later was placed in charge of divisions in Denver and Omaha. He came to New York in 1924 to assume the post he held at the time of his death. During World War II, he was special representative of the Sinclair Co. in Washington. He served in World War I as a captain in the Infantry.

William F. Milward

William F. Milward, general manager of Coventry Victor Motor Co., Ltd., Coventry, England, died Dec. 17 after a five-month illness. He was 66 years old.

Mr. Milward joined Coventry Victor Motor Co., Ltd., in 1940 as general manager in charge of war production. Some years prior to that he was the designer of the Charron-Laycock car which was produced by W. S. Laycock, Ltd., of which he was chief engineer.

Mr. Milward joined the Society in 1922.

Theodore W. Koerner

Theodore W. Koerner, who had been on special assignment work with Nash-Kelvinator Corp., Detroit, died recently at the age of 70.

A native of Green Island, N. Y., Mr. Koerner graduated from Troy Academy. He worked as a machinist with several firms and in 1903, he served at the Watervliet Arsenal, N. Y., as a machinist and superintendent. In 1917 he joined the American Brake Shoe & Foundry Co., Erie, Pa., as a consulting engineer and master mechanic. Prior to his association with Nash-Kelvinator, he was mechanical assistant to the president of the Gemmer Mfg. Co., Detroit.

M. Lloyd Vanciel

M. Lloyd Vanciel, a first lieutenant in the USAAF, was killed in line of duty in December, 1944. Lieutenant Vanciel was 27.

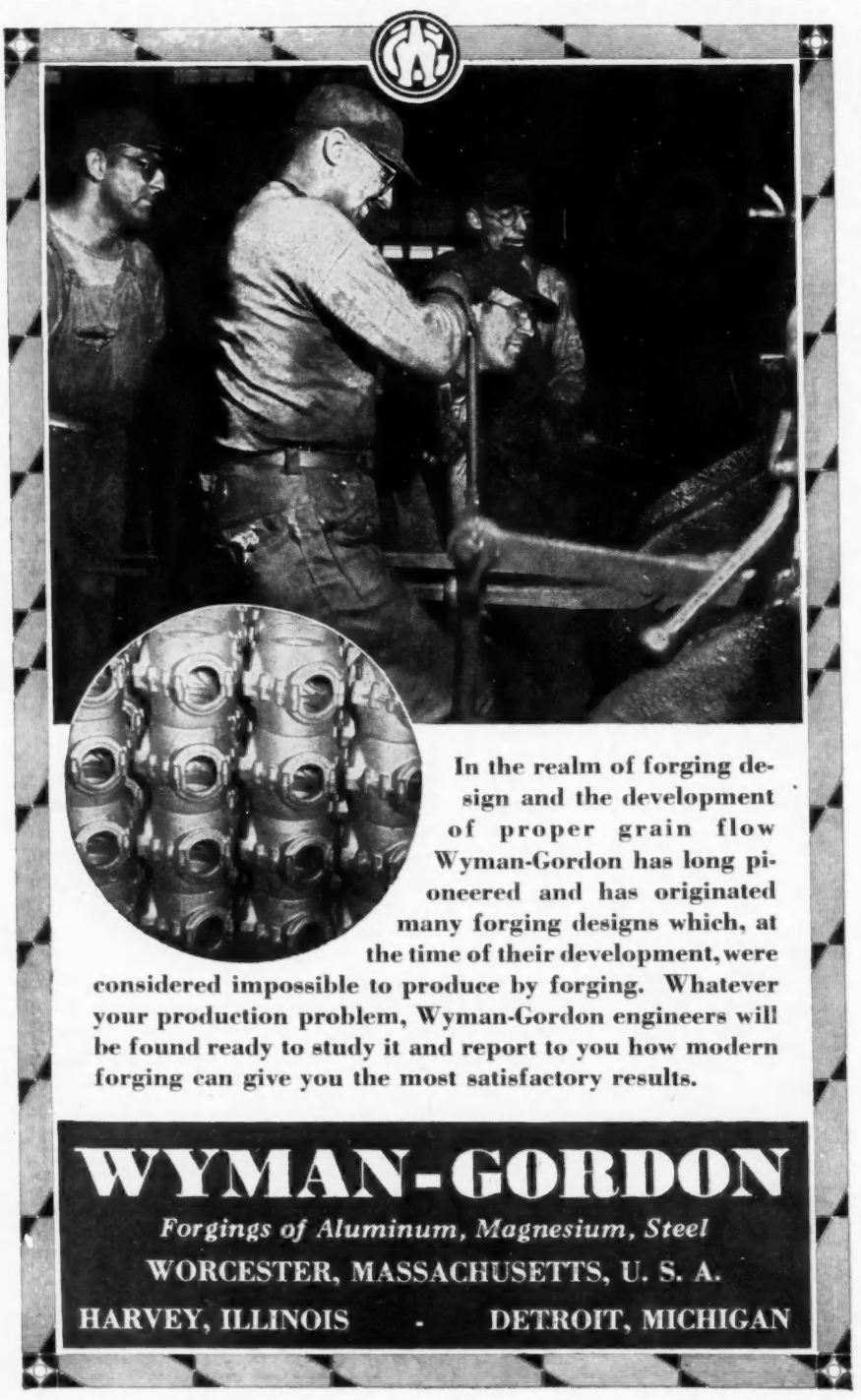
Before joining the Army, Lieutenant Vanciel was associated with the Ethyl Corp. in Kansas City, Mo., and Baltimore, Md., as tune-up engineer. Prior to that he served with the Ethyl organization in Los Angeles as an electrician.

He was elected to associate membership in the SAE in 1940.

Philip L. Irving

Philip L. Irving, superintendent of tool design, Mueller Brass Co., Port Huron, Mich., died recently at the age of 56.

Shortly after he attended St. Michael's School in Flint, Mich., he joined the Essex Brass Co. in Detroit. Since 1918 he had been associated with the Mueller Brass Co., first as foreman on fuze operations. He was later placed in charge of the drafting and tool design department and also method and machine, job layout, and production estimates.



In the realm of forging design and the development of proper grain flow Wyman-Gordon has long pioneered and has originated many forging designs which, at the time of their development, were considered impossible to produce by forging. Whatever your production problem, Wyman-Gordon engineers will be found ready to study it and report to you how modern forging can give you the most satisfactory results.

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SAE VETERANS AVAILABLE

Following are briefed experience records of SAE veterans of World War II who are seeking employment through the SAE Placement Service. Interested employers are invited to address inquiries by number to SAE Placement Service, Society of Automotive Engineers, 29 West 39 St., New York 18, N. Y.

4789 Automotive Fleet Engineer, 43, 20 yrs. varied experience in operation of large motor truck fleets. Thoroughly experienced in shop practices, preventive maint., purchasing of parts and equipment, replacement and standardization programs, cost accounting and training of mechanics and drivers, safety work. Resident – Va., location open.

4902 Grad. of Aero. Engrg. School, 24, desires a job with an aircraft factory in Met. N. Y. area. 2 yrs. stress analyst on helicopters, 2 yrs. USAAF helicopter specialist. Resident – N. Y. C.

5037 Automotive Engineer, 52, honorably discharged USAAF Jan. 1, 1945, after serving overseas as Major and Lt. Colonel, experience in research, lubrication, as mgr. of sales petroleum co., super-service stations; can handle fleet operation, take complete charge of shops and can handle men. Available immediately. Resident – Chicago, location open.

5039 Prod. Engr., 37, experienced in aircraft engine maint., working for Army Air Depot, discharged soldier World War II, 10 points preference with Civil Service Comm., foreign languages French and German, available now. Resident – Utah, location preferred – East or Europe.

5096 Transp. Engr. and Supt. of Automotive Maint., 56, experienced heavy duty equipment both diesel and gasoline powered, has had wide experience in field inspections, also setting up and teaching in automotive schools. Speaks French and German. Will consider foreign service. Army service. Has had charge of large shops, maint. of all types of motor cars and trucks for manufacturer, dealer and fleet owner. Resident – N. Y. C., available immediately.

5099 Mechanical Engineer, 27, experienced in aircraft engine and spark plug testing and general aircraft inspection. Now in Army, desires maint. engrg. position with an airline. Will accept U. S. or foreign location. Resident – Pa.

5102 Young Grad. Aero. Engr., 26, with 3 yrs. experience, desires engrg. position involving coordination of design, tooling and prod. depts. Discharged veteran AAF. Willing to undertake advanced schooling in preparation for possible future executive position in organization. Has completed one yr. grad. work in business adm. Resident – Ohio, prefers New England or Midwest location.

5127 Fleet Operation, Maint. and Service Supt., 48, wide experience in truck transportation, also heavy equipment such as road equipment and cranes. Recently discharged U. S. Navy "Seabees" after 2 yrs. in South Pacific Islands. Resident – Calif., location open.

5132 Grad. Aero. Engr., 30, experience in aircraft engine installation, prod. engine testing, engine experimental engrg. and wind tunnel testing. Desires position in prod. engrg. with opportunities in prod. management. Resident – Penn., location open.

5133 Aero. Engr., 45, married, dependent, lawyer, admitted legal practice 12 yrs., grad. Naval Engineer, 8 yrs. experience mostly aeronautical; BS, LLb. Naval Eng. JSDr.; supervisory experience in research, design, electric, physical and hydraulic testing, magnetos, highly precision equipments. Quality control organizer. Desires position with airline and/or where legal and engrg. knowledge and experience both useful. Released USAAF Sept. 30, 1945, also served in World War I as test pilot (flying boats). Resident – N. Y. C., prefers N. Y. or foreign location.

5134 Aero. Engineer, 31, 8½ yrs. experience in airline, aircraft engine co., aircraft co. and Army Air Forces, desires permanent connection in aeronautical industry or engrg. sales. Resident – Calif., location open, foreign considered.

Specify ROCKFORD SPRING LOADED for CLUTCHES

LIGHT PEDAL PRESSURE

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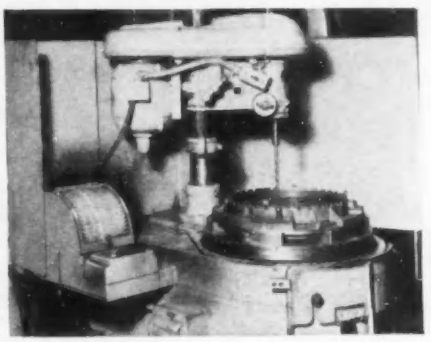

* All ROCKFORD Spring-Loaded CLUTCH plates not only are carefully checked for accuracy of dimensions and flatness but are electronically inspected, on this special machine, to make sure that each has correct dynamic balance. Uniform operation, minimum wear, less-frequent adjustment and long life qualities of ROCKFORD Spring-Loaded CLUTCHES thus are protected during production. These quality safeguards help insure low maintenance, after the clutch is installed.

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It shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications. Every production engineer will find help in this handy bulletin, when planning post-war products.

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5157 Service Mgr. or Sales Service Engr., 39, 12 yrs. experience for mfgr. of industrial engines (gas diesel) automobiles, trucks, marine engines, tractors, road building equipment or allied automotive equipment. Resident – Detroit, prefers Midwest location.

5165 Naval Officer, 40, ME and MME degrees, available soon, 20 yrs. experience gasoline and diesel engine development, research, motor coach fleet operation, executive ability, lab. direction. Resident – L. I., prefers L. I. or Met. N. Y. location.

5186 Navy Test Pilot, 29, 8 yrs aero. design and flying experience, ME degree. Desires sales engrg., contact, dev. or test work. Will travel anywhere. Available immediately. Resident – Penn.

5205 Sales or Service Promotion, grad. ME, 42, recently Captain Marines, desires connection with car, truck or parts manu. or major oil co. 20 yrs. experience. Location open, available immediately, resident – N. Y.

5216 M.E. Grad., M.I.T., 26, former Naval officer, experience toolmaker, has held CE and Prod. Mgr. positions in metal fabrication and assembly. Available immediately. Resident – N. Y., location open.

5217 Tool Process Engineer, 30, married, veteran Army Air Forces, physically fit, 10 yrs. wide practical experience tool and gage mfg. and inspection. Available immediately, temporary resident – Denver, Colo., prefers Detroit area.

5218 Industrial Engineer, General Foreman, Prod. Mgr. or Supt., 43, Army officer (Major), transferred to inactive duty, 20 yrs. experience in machine tool field, in handling and supervising personnel. Best of character. Available immediately. Resident – Va., location open.

5219 Production Engineer, 33, grad. EE, 7 yrs. experience supervising manu., prod. and inspection of automotive parts, 4 yrs. as project and liaison officer on tracklaying vehicles for Ordnance Dept. Resident – Mich., location open.

5242 Experimental Engineer, 34, 10 yrs. experience, now Major Ordnance Dept., desires supervisory position in automotive engine dev., sales engrg. or accessory fields. Available now. Resident – Detroit, prefers Conn. or Detroit location.

5255 Mech. Engr., 25, BS Iowa State, 2½ yrs. experience testing performance of B-29 airplane, maint. test crew flight engineer and experience with maint. and overhaul of aircraft engines and allied equipment. Desires work in internal combustion engine testing or design. Resident – Iowa, prefers Midwest location, otherwise open.

5256 Research & Dev. Engr., 24, married, 6 yrs. varied experience in designing and dev. of diesel engines and accessories. Experience includes gas turbines and superchargers. Capable and experienced in project planning and supervision. Desires position with progressive firm. Resident – N. Y. C., prefers Met. N. Y. location.

5262 Mech. Engr., 23, former Air Corps Engrg. officer, 3 yrs. experience in design, plant and aircraft maint., shop processes, field work. Desires machine design, prod. dev. or plant maint. position. Resident – N. Y. C., prefers Met. N. Y. or New England location.

5267 Grad. M.E., 23, veteran, on "Dean's List of Distinguished Students" for 4 yrs., speaks, reads, writes German fluently, 2 yrs. experience in assembly, repair, maint., operation of diesel and automotive equipment, desires research or experimental work. Resident – L. I., prefers eastern location.

5268 Mech. Engr., 35, Master's degree with 1 yr. experience in diesel fuel injection research; 6 yrs. experience as field engineer for prominent industrial consultant involving cost reduction programs in diversified industries through better methods, equipment, plant layout, etc.; served 4 yrs. as Captain, assigned to Office of Chief of Ordnance – Detroit, Dev. Div., as Project Engineer and carried through to completion 14 major vehicle dev. projects. Released from Army Dec. 31, 1945. Desires responsible position in progressive co. as Industrial Engineer, Dev. Engr. or Sales Engineer. Resident – Mich., location open.

5271 Research and Test Engineer, Army officer, 27, available soon, BS, ME and ME grad. courses, 5 yrs. engine experience. Possesses civilian and Army (Proving Ground Command) experience, initiative and interest in aircraft type reciprocating engine and gas turbine dev. and testing work. Presently in chg. of large and im-

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The six-sided Drillet Box Jig above and at right has a range of 125 different sizes, making it possible to accommodate all sizes up to 6" capacity—for drilling, reaming, counter boring, counter sinking, spot facing, tapping, etc.

The Drillet Box Jig makes special tool design for drill jig unnecessary. Saves up to 75% of the time and cost of building a jig body. By merely turning thumbscrews and raising leaf, parts may be quickly loaded or unloaded. The jig may be used on all six sides, taking advantage of its full capacity.

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Besides the satisfaction chewing gives you, it helps keep your mouth moist and fresh so you naturally feel better—and feeling better you work better.

Scores of industrial plants report that they have stepped up their workers' morale and efficiency by making chewing gum available to them.

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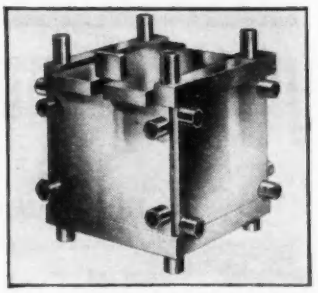

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portant Air Corps engine investigating program. Desires permanent, responsible position with co. doing reciprocating engine or gas turbine research, dev., etc. Prefers Detroit location, otherwise open. Resident – Fla.

5276 Mech. Engr., Lt. USNR., 24, available now after completing 18 mos. postgrad. design engrg. course at U. S. Naval Academy, 2 yrs. naval experience supv. ship construction and machinery repairs, 7 mos. in test dept. of truck and bus manu. Especially desires position with future in prod. or sales. Resident – N. Y. C., prefers N. Y. C. location, otherwise open.

5279 Mech. Engr., 24, to be released from U. S. Navy, desirous of research in diesel engrg. or engrg. rep. in foreign countries (France, China). Good knowledge in French and Chinese. Schooled in diesel engrg. in Navy. Resident – N. Y. C., stationed in Colo., location open.

5285 Automotive Engr. Grad., M.I.T., 26, 4 yrs. experience in gasoline and diesel engines and gas turbine dev., research and service. Desires position in sales or sales-service. Available immediately. Resident – Mass., location open.

5287 Grad. Mech. Engr., 34, experienced in research and dev. in aircraft power plant and petroleum industries, desires position as executive engineer involving supv. and adm. of engrg. projects of an experimental character and in such capacity to direct the purchasing requirements and experimental investigations incident to the dev. Now serving as Lt. (s.g.) in U. S. Navy, to be released in Spring, 1946. Resident – N. J., stationed in Wash., D. C., location open.

5288 Automobile Engineer, 26, ex-British Army officer, married, experienced in development and research work, wishes to contact American co. with view of coming to U. S. Would be prepared to be engaged for time being as European rep. Resident – London, England.

5296 Young Grad. M.E., 21, 1 yr. USMM, marine engrg. Desires machine design, prod. dev. or experimental work. Speaks fluent Spanish and French. Resident – N. Y. C., prefers Met. N. Y. or New England location.

5298 Mech. Engr., 26, 3 yrs. aircraft maint. officer in Air Corps. Experience in supv. of aircraft and accessory overhaul shops. Desires aircraft or engine overhaul and maint.; aircraft or other internal combustion dev. and prod. Resident – N. Y. C., prefers N. Y. C. location, otherwise open.

5299 Fleet Maint. & Serv. Supt., 37, wide experience large automotive fleet maint. A-1 at preventive maint. methods and cutting operational costs. Also qualify as serv. mgr. experience, selling service, flat rate and time study. Understands handling personnel, especially mechanics. Army Quartermaster – civilian automotive instructor, teaching principles and repairs; Navy – district automotive maint. officer. Advisor maint. procedures and problems, field inspector. Location open, resident – N. Y. C., available now.

5301 Mech. Engr., 25, 4 yrs. AAF and civilian supervisory experience in aircraft and engine maint. Prefers position involving research or project development. Now in Army, will be out shortly. Resident – Chicago, prefers West or Midwest location.

5302 Executive: Auto and Transp., 40, married, grad. EE, inactive officer just completed 2 yrs. as Transp. Officer in China and 3 yrs. Chief Exec. Automotive Training School. Previous experience as executive engineer 6 yrs. design, test, and application of automotive brakes and 4 yrs. design, test and application elect. equipment. Resident – Georgia, prefers southern location, otherwise open.

5304 Mech. Engr., 25, veteran Air Corps Engrg. Officer, general experience with small arms ordnance in prod. and for the Army; 2 yrs. experience writing specifications on AAF instruments, electrical and electronic apparatus. Particularly interested in industrial electronic controls. Available immediately. Resident – N. Y. C., prefers N. Y. area, otherwise open.

5306 Aero. Engr., 29, BS in AE, 4 yrs. drafting and stress analysis, 5 yrs. Air Corps procurement, one yr. project officer on cargo airplane, Wright Field and supv. experience. Desires sales or leading to sales. Resident – Calif., prefers West or East Coast location.

5315 Grad. Aero. Engr., 30, 3 yrs. Naval aircraft maint. officer, 6 mos. liaison engineer aircraft mfg., 2 yrs. layout and design aircraft components, 3 yrs. automotive me-

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chanic. Desires sales and service work. Resident – Maine, location open.

5316 EE., Executive or Adm., 31, 10 yrs. experience electronics, servos, aircraft and industrial controls, aircraft ignition, sales engineering. Qualified in automatic temperature controls, propeller pitch controls and automatic pilots. Previous positions: Head of Research Lab., Central Office Engineer, Asst. CE, CE. Capable of directing activities and handling men. Resident – N. Y., prefers N. Y. area.

5318 Service & Sales Engineer, 38, MS in ME, recently Lt. Navy technical air intelligence, 2 yrs. analyzing aircraft equipment, 5 yrs. experience analyzing and overcoming service difficulties and sales resistance in diesel engine and automotive equipment field, 5 yrs. technical instruction and preparation maint. manuals. Resident – Calif., prefers Calif. location.

5319 Mech. Engr., 29, honorably discharged from Ord. Dept., U. S. Army. Served 6 yrs. testing ordnance automotive equipment. Desires engine installation engrg., sales or service engrg. Resident – Md., location open.

5332 M.I.T. Grad. M.E., 36, Lt. Comdr., 12 yrs. experience diesel engine, truck, bus, gear, vibration, strain gauge testing, desires position in vicinity of N. Y. Resident – N. Y.

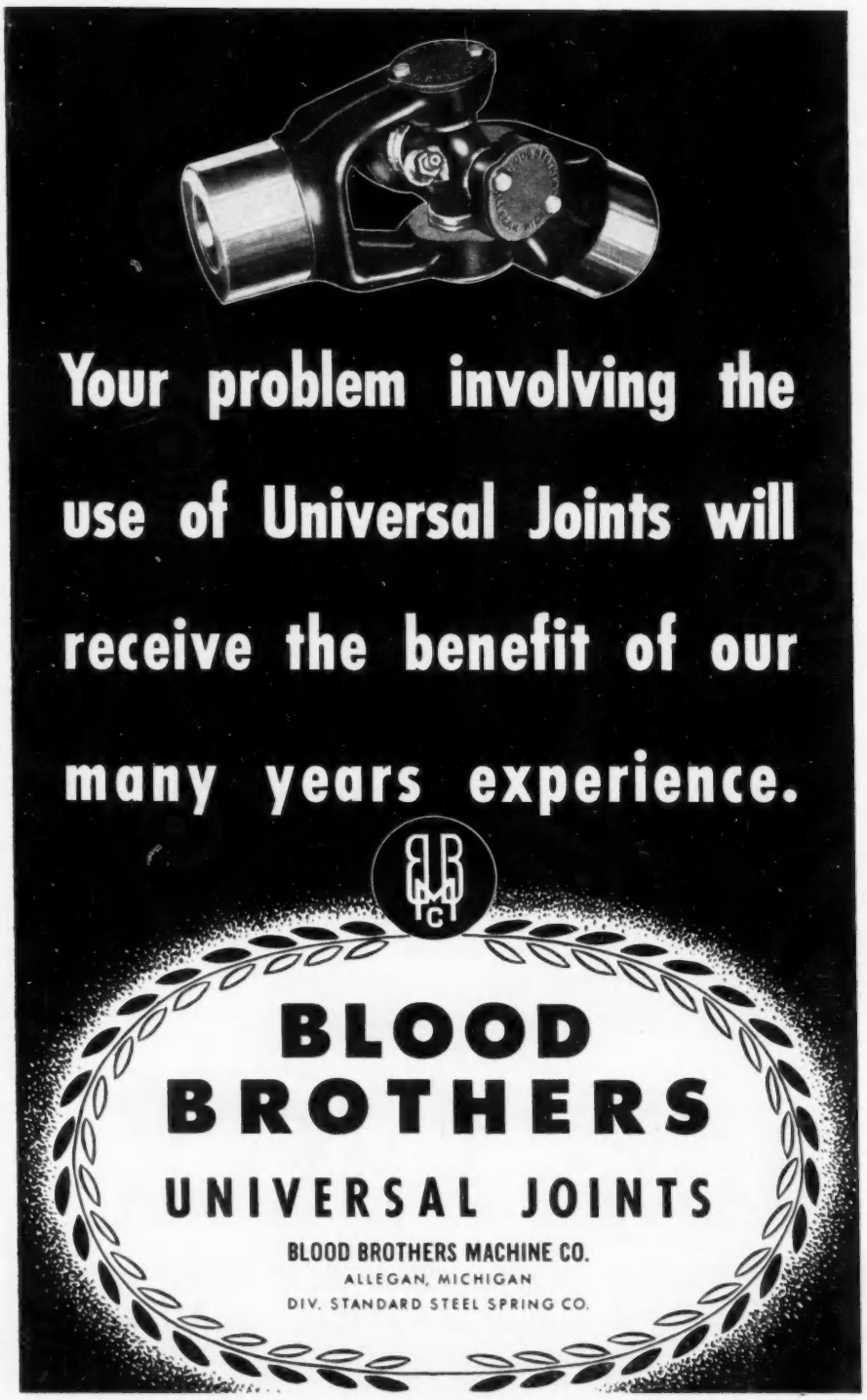
5333 Mech. Engr., 26, 2 yrs. aircraft engine prod. and dev., 2 yrs. diesel, gasoline engine & electrical operation, maint. and repair. Desires development, service or sales, internal combustion or petroleum field. Resident – Ga., available May, 1946, prefers Southwest location, otherwise open.

5336 Service Engineer, 32, car and truck export experience, desires service and/or sales representative position. Background experience in truck fleet maint. Grad. ME, former Lt. (jg) USNR. Resident – N. Y., prefers South American location, otherwise open. Available immediately.

5337 Mech. Engr. Grad., 23, married, 3 yrs. experience, 1 yr. post-grad. study in Automotive Engrg., now Naval Officer, desires sales/or service engrg. position. Available May, 1946. Resident – N. Y., stationed in Penn., location open.

5346 M.E. Grad., Cal. Tech., 24, married, former Naval Officer. 2 yrs. Navy Yard experience in planning and prod. divisions involving ordnance installation, repair and maint. Available immediately. Resident – Los Angeles, prefers Los Angeles area.

5347 Mech. Engr., 27, married, BS in ME, 2½ yrs. experimental dept. aircraft engine co., 3 yrs. Lt. Marine Corps aircraft engine trouble shooting. Desires experimental engine dev. work, aircraft or automotive. Available March 15. Resident – Va., location open.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WEATHER WORRIES

continued from p. 30

cabin pressurization will be of assistance in avoiding flight levels where turbulence and icing conditions are present.

Long haul flights can benefit through "area flying" rather than strict adherence to a fixed route. As an example, a high-speed New York-Los Angeles flight operating on the area flying principle, in order to take advantage of good weather and winds, might deviate as far north as Omaha or as far south as San Antonio.

Constantly increasing traffic with resulting airway congestion under current methods of air navigation and traffic control is a very serious problem for the present or interim period. More flights must be safely accommodated on our airways system through improvement of existing navigation and traffic control facilities and practices. Improvements in the present air navigation and traffic control system can be merely a temporary expedient, as the volume of future traffic will require much closer spacing of flights on airways than current facilities can tolerate, and indications are that an entirely new approach to the problem may be necessary. In this respect there are some promising solutions offered through application of known principles of radar and television.

NEW MEMBERS Qualified

These applicants who have qualified for admission to the Society have been welcomed into membership between Jan. 10, 1946, and Feb. 10, 1946.

The various grades of membership are indicated by: (M) Member; (A) Associate Member; (J) Junior; (Aff.) Affiliate Member; (SM) Service Member; (FM) Foreign Member.

Baltimore Section: Archibald Craig (M).

Buffalo Section: Bartram Kelley (M), John T. Mitten (A).

Canadian Section: John Chanik (M), Albert L. Lord (M), Jack H. McNulty (M), Joseph C. O'Neil (A), Frederick Gordon Willmot (A).

Chicago Section: George F. Bowers (M), C. J. Bredemann (A), Alfred J. Corsini (A), Herman Owen De Boer (A), Donald R. Diggs (J), Frank E. Farrell (A), Kenneth William Gehrke (J), Joseph Gregory Green (M), Carl Hansen (M), Wallace Hopper (A), E. M. Kase (A), Eugene Lieber (M), Parmer Bruce Maxwell (A), George J. Morgan (A), Roger E. Schlemmer (SM), Arthur Folsom Weston (A), George N. Wickhorst (A), William Paul Youngclaus, Jr. (A).

Cincinnati Section: Ward N. Shaw (A).

Cleveland Section: John K. Anthony (M), Earl William Conrad (J), Gerald W. Englert (J), John K. Folk (J), Ross Lauder Fryer, Jr. (M), Robert Gorden Hanneman (M), Thomas W. James (A), Ernest H. Johnson (M), Robert Charles Lieblein (M), William P. Murphy (A), John Palasics (J), William D. Stemples (J), Charles D. Strang, Jr. (J), Robert William Titgemeyer (J), John K. Tomko (M), Tom R. Tompkins (J), Jean N. Vivien (J), James W. Weaver (M), Oscar F. Welshans (M), Clifford E. Willis (J), J. Russell Winch (A), George Wishnek (J).

Colorado Group: Austin J. White (A).

Dayton Section: Everett Palmer Garratt (J), Willard M. Neff (SM), Richard W. Shaw (J), H. G. Spier (M), Clifford B. Wright (J).

Detroit Section: Charles R. Averill (M), Joseph Fredrick Carpenter (J), Robert T. Curcuru (M), Mrs. Ruth E. DeWald (J), Charles B. Ford (A), Major Theodore Joseph Hollenkamp (J), Fred J. Holmes (M), George T. Jones (J), Lt.-Col. Harry L. Keeler, Jr. (SM), Thomas G. Kinney (J), Jos. E. Krug (M), Frank D. Leonard (A), Raymond F. Littley (A), Thomas Willard Milton (M), Theodore F. Peters (M), Maurice L. Reifsnyder, Sr. (M), Nicholas E. Rothenthaler (M), Walther F. Scheel (M), George M. Schueder (M), John J. Stewart (J), William H. Taylor (M), Edward Lothrop Warner, Jr. (A).

Hawaiian Section: Simes Thurston Hoyt (M), Setsuji Kawamura (J), Cady Lynn Thornton (A).

Indiana Section: Robert T. Jackson (M).

Kansas City Section: P. T. Naudet (M), Sidney R. Wolf (J).

Metropolitan Section: Warren B. Brady (A), Charles S. Davis, Jr. (J), P. A. De Padova (M), William A. Furst (M), John E. Hickok (J), S. P. Kemm (A), Joseph E. Knight (M), Roger M. Mahey (A), John Everett Plantinga (J), John H. St. John (J), Thomas Forster Wardle (J).

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Southern California Section: John F. Callahan (M), John H. Clarey (A), Paul J. Duvall (A), J. E. Fouch (A), Perry Glover (J), Robert Edwin Hartsock (J), Leonard E. Hobby (J), George A. Honzik (J), Walter J. Hyatt (J), J. Charles Joyce (M), Lt. Robert E. Klein (J), William A. Lippman, Jr. (A), Col. Frank C. Lynch (M), Rodney C. Magner (J), George L. Michky (M), Francis H. Ott (M), Lloyd James Pittman (J), Thomas Keith Radcliffe (J), Robert Thomas Rice (J), William Russell (A), Paul C. Swan (M), Stanley T. T. Urbaniak (J), Edmund Wilkes, III (J), James H. Williams (J).

Southern New England Section: John A. Dickie (M), Edward E. Kirkham (J), Melvin Elbert Longfellow (M), Samuel Jasper Loring (M), Robert G. Melander (J), George Herbert Mills (A), Lt. Jacob William Parks (A).

Spokane Group: Lawson G. Black (A).

Texas Section: Dave Hill (A), Preston J. McCombs (A), Billie F. Tullis (A).

Twin City Group: Robert J. Kutzler (M).

Virginia Group: Holmes Koerner (A), Wilbur Monroe Loving (A), John Guy Palmore (A), John G. Strand (A), Wesley Abbott Walker (M), Reed I. West (A), Nathaniel Edward Whitlow (A), John W. Wills (A).

Washington Section: A. R. Pierce (SM), Walter H. White (SM).

Western Michigan Section: Douglas W. Bond (J), John G. Yates (A).

Outside of Section Territory: George Van Vlack Dickerson (M), Lt. Howard Jarmy (J), Boris M. Osojnak (J), Lynn M. Phillips (M), Howard Krook Pike (M), Don A. Plett (M), Henry Tennant Wright (J).

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APPLICATIONS Received

The applications for membership received between Jan. 10, 1946, and Feb. 10, 1946, are listed below. The members of the Society are urged to send any pertinent information with regard to those listed which the Council should have for consideration prior to their election. It is requested that such communications from members be sent promptly.

Baltimore Section: T. Gardner Hill.

Buffalo Section: Eames Donaldson, Claude P. Hart.

Canadian Section: William Roy Aikins, John Robert Fawcett, George W. Tutton, Percy E. Walters, J. V. Watts, Chieh-Nge Wen.

Chicago Section: J. Dana Brown, J. Robert Chelius, George Richard Coffin, Otha Leroy Colwell, Howard A. Cronmiller, Harold J. Hlavka, William Lawrence Kolb, Stephen M. Lillis, Robert Walter McNabb, William R. Mogg, Frank M. Moyes, Jack Milford Norris, George William Oehlsen, Jr., William Steinwedell, Charles E. Trailkill, Henry A. Wachter, John L. Winge.

Cincinnati Section: Gus A. Broetzler, Clifford Duhme, Hall-Rattermann Oil Co., Russell Edwin Wolfe.

Cleveland Section: Robert Paul Bradshaw, Wiser Brown, J. Delmont Durham, L. J. Fageol, Walter A. Franck, Gilbert H. Hannon, John L. Menrath, Ralph W. Sohl, Frank L. Suozzi.

Colorado Group: Charles D. Douglass.

Dayton Section: Harvey W. Dean, Capt. John A. Dilworth, III, Lloyd F. Engelhardt, Charles H. Marshall, Fred Schwenk.

Detroit Section: Herbert J. Arnold, Raymond A. Boyle, John Edward Brennan, Rinehart S. Bright, Arthur S. Brown, B. Gratz Brown, David H. Brown, Hermann C. Brunn, John L. Butler, Liborio L. Curcuru, Mark T. Feeley, R. Grey Firth, Clare H. Graham, Erwin R. Habermas, J. Stephen Hammer, Albert Hollerud, George J. Huebner, Jr., George H. Hunt, Eugene V. Ivanso, Stephen E. Kershaw, John L. King, Dietrich Kohlsaat, Robert W. Kos, Edwin Robert Langtry, George H. Link, Alan G. Loofbourrow, John D. Lorimer, Johan Lund, Robert H. Madison, John A. Matousek, Herbert F. McClure, James R. McCordic, Thomas J. McIntosh, Robert J. Meier, Leonard C. Meyer, Walter H. F. A. Noffke, G. L. Ogdin, Jr., John T. Rausch, Erland Reuter, Samuel H. Rose, Ted M. Scott, Edward M. Sharer, Leslie Southgate, Thomas Stock, Jr., John A. Swint, Ray C. Ulrey, Earl E. Wagner, Herbert C. Wendt, Gene M. Wiegand, Max E. Wilde, James B. Williams, Joseph A. Zoehrer, F. A. Wunderlich.

Hawaiian Section: Herman A. Bishaw, Maurice C. Butler, Charles L. Eaton, Louis M. Eihl, Stephen Joseph Michlstein, Lynott B. Root, Nathaniel Ewing Warman.

Indiana Section: John R. Bennett, Jesse L. Click, James Kirk Gregg, Floyd V. Tibbets.

Metropolitan Section: Henri M. Barat, Ernest S. Burrows, Preston Sumner Erlick, Fernand L. Gerin, Capt. Frank W. Hogan, Jerry R. Hudnall, Jr., George A. Martin, Leonard A. Maybarduk, Clark J. Moody, Edward A. Neu, Jr., Frank A. O'Connell, David E. Parker, Bretislav Prochazka, George Albert Roberts, I. P. Stafford, Martin V. Vaccaro, Capt. A. L. Van Nest.

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6 DESIGNS FOR A WINDSHIELD

The people in the Engineering Research building at Lockheed, Factory B-1, Burbank, point out that the unique windshield design on the *Constellation* didn't just happen. Five experiments preceded it.

Windshield No. 1 went into a completely faired nose. It looked good on paper, but when it was mocked up Lockheed found that vision for pilots was bad.

Type 2 (shown at left) was an attempt to put the crew "downstairs." This turned out to be a failure because it would have been pretty uncomfortable for a belly landing.

The engineers next tried two small bug-eyes, which were successful only in giving the crew claustrophobia. See discard No. 3 at left.

A wide, single bug-eye type was tried next, but was found difficult for pressurization.

Fifth was a conventional "Vee" windshield, but the fuselage was too big to allow for an effective design.

The sixth windshield was adopted. Besides being the lightest of all, its many small panels give excellent vision angle as well as convenient control and instrument arrangement.

This kind of inspired persistence in going on all the time at Lockheed—the kind that makes good planes and good telling.

L to L for L

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Spokane Group: Harley James Papineau, Almontie C. Smith, Roy Neal Williams.

Syracuse Section: E. E. Baldwin, Richard L. Burke, Jr., John Alden Kline, Robert S. Root.

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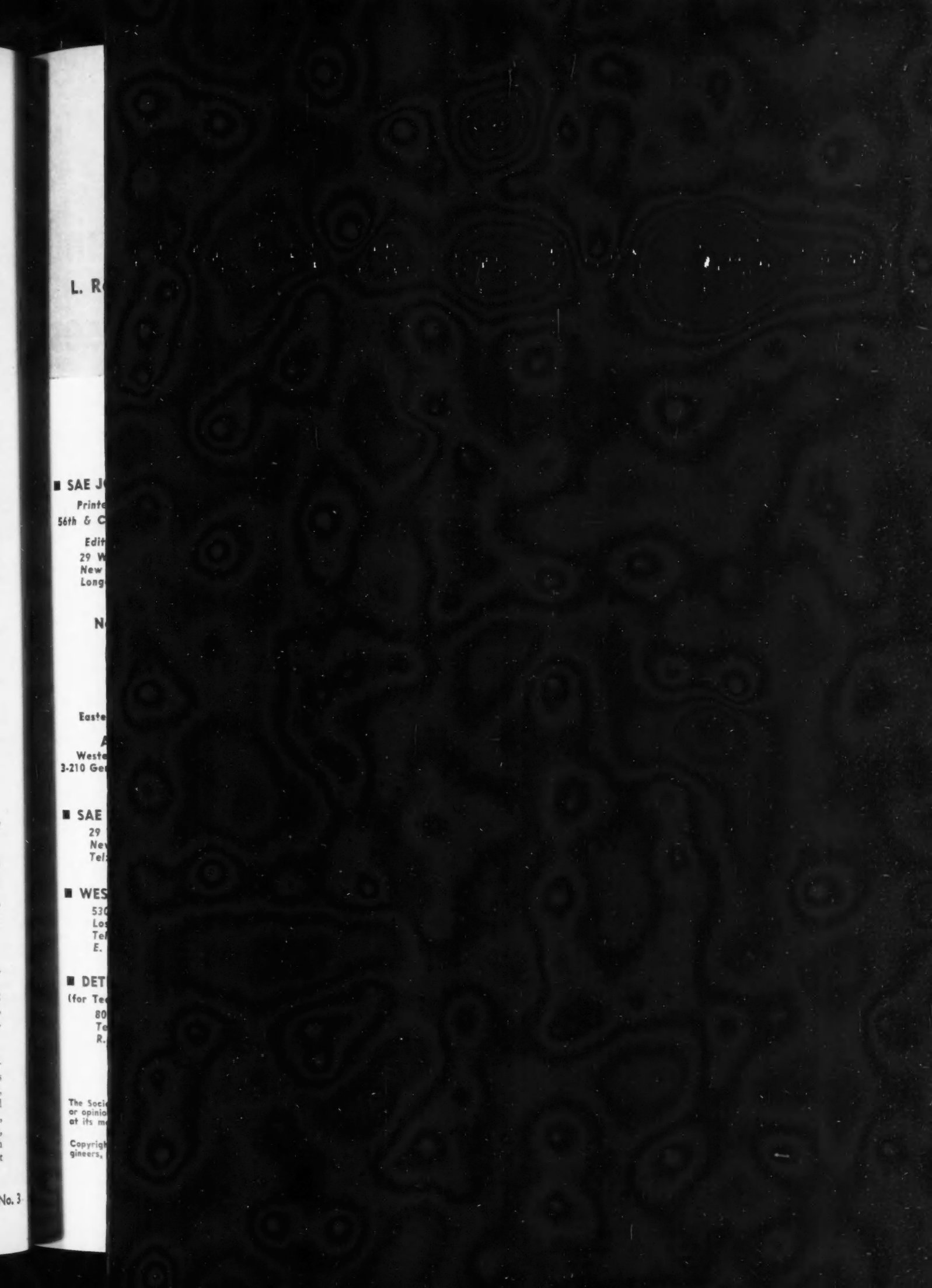
Virginia Group: George W. Aron, Selden Longley Baird, Joel H. Burton.

Washington Section: Axel B. Niskanen, Joseph E. Pauzé, Major Kenneth V. Shane.

Western Michigan Section: Samuel A. DeMilio, Richard C. Fox, Roy W. Hotham, Edward J. Picard.

Wichita Section: Virgil H. Adamson.

Williamsport Group: Byron Lawrence Carpenter.

Outside of Section Territory: Edward Halket Allen, Reginald Rufus Beezley, Robert K. Jack, Jr., William E. Knapp, Wendell A. Neeland, Clifton C. Rousseau, Given W. Spragins.

Foreign: J. R. Bouhourd, France; Alexander Callander, England; Andre E. Mandel, France; James Stuart Hamilton Moore, England; Alfred Giles Lovie, New Zealand; Joseph Pickles, England; John Campbell Mackechnie Sanders, England; Sonnerdale Pty Ltd., Australia; Bertram Jacob Tams, England; Max Troesch, Switzerland; Rio Nusser Van Mirza, England; Kenneth Albert George Woodbine, England; Frank Nesbit Wright, Australia.